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Paper Manufacturers Convene In Montreal

R. A. McInnis Reelected President of Canadian Pulp and Paper Manufacturers Association For Fourth Term — Meeting Is Most Largely Attended In History of Association—Reports of Various Sections Presented.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., January 27, 1939.—The annual three-day convention of the Canadian Pulp and Paper Association, which was brought to a close here this evening, was the most largely-attended function of the kind in the 26 years of this organization's existence, and judging by the wide field covered by the addresses, the paper and reports presented, and the high standards of these and the discussions that took place upon them, it was the most instructive and fruitful.

It is generally recognized in the industry, of course, both here and in the United States, that the past year has been a most anxious and trying one to pulp and paper manufacturers. Not only was the general recession in business which prevailed over most of 1938 directly responsible for a marked diminution in the demand for pulp and paper, but there was the further effect of increasing diversion of advertising appropriations from daily newspapers to radio broadcasting and magazines which accentuated the decline in newsprint consumption. Briefly put, the net effect of this combination of circumstances was that the total exports of pulp from Canadian mills declined from 17,414,317 cwts. in 1937 to 11,080,742 cwts. in 1938, and that the total exports of newsprint declined from 69,104,793 cwts. in 1937 to 48,493,092 cwts. for 1937. The result, despite an increase of $7.50 per ton in the price of newsprint, was that the total value of pulp and newsprint exported from Canadian mills in 1938 showed a drop of nearly $36,000,000 as compared with the previous year.

This state of affairs had an effect on the discussions at the convention and brought into sharp relief the value of the technical work which has been so assiduously pursued over many years by the Woodlands and Technical Sections of the Association. Judging by the addresses and the discussions, the general feeling prevailed that the future prosperity of the industry rests largely on improvements in technical processes to permit of such economy in production as will enable the industry to meet competition, no matter from what source it may come, and improvement in the quality of the newsprint to enable newspaper publishers to meet the competition from the magazine field. In this latter connection emphasis was laid upon work being done to adapt newsprint to the rapidly-growing popularity of the use of color. Considerable progress has already been made in this direction.

Whether it was timed in that way or not, the circularizing of the trade by one large Canadian newsprint producer with successful examples of high-class color reproduction on an improved quality of newsprint coincided with the meeting of the association. This newsprint, which is now being used in the magazine section of the Christian Science Monitor, is produced by use of the Minton vacuum drier, inside of which pressure is maintained at so low a point that water boils at 104 degrees, the temperature of a warmish bath. The drying of the paper in this way results in a brighter yet less transparent sheet, and extraordinary examples were shown of successful examples of reproductions of pictures on this paper in monochrome and in full color.

One of the most significant reports presented at the meeting in connection with the application of science to the evolution of the industry, and of the possible effects of this upon Canadian mills, was that of Dr. Hibbert, Professor of Industrial and Cellulose Chemistry, McGill University. He reported that the solution of the problem of lignin was now well in sight. Not only did he indicate that this might mean valuable by-products from the manufacture of pulp, but that it might have a profound effect on the future of the pulp and paper industry. He would be failing in his duty to the Association, he said, were he not to point out that most probably within the next five to six years there were likely to be fundamental changes in the manufacture of pulp and paper, and that such benefits were likely to accrue to the sole benefit of the Southern States' industries unless adequate attention is given to the effect of this development on the Canadian situation. A further warning given by Dr. Hibbert was in respect to the extensive research institutes now being established by the United States Government which, if concentrated on the utilization of wood, might lead to developments which would possibly threaten the actual existence of a future Canadian pulp and paper industry. The report of Dr. Hibbert on these points is given in full later on in this review of the Convention.

(Continued on page 14)

Marked Improvement Forecast for Industry

D. Clark Everest Head of Marathon Paper Mills and President of American Paper and Pulp Association Sees Better Times Ahead With Probable Increase In Volume Up To 20 Per Cent — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., January 30, 1939—Marked improvement for the paper industry this year is seen by D. Clark Everest of Wausau, Wis., president and general manager of the Marathon Paper Mills Company, and president of the American Paper and Pulp Association.

In an interview given out last week, he says:

"As to the industry in 1939, I believe we shall enjoy a considerable increase in volume, probably ranging from 15 to 20 per cent in the different divisions. This statement is qualified to the extent that there is no major conflict in Europe during the coming year.

"We all know inventories in the hands of merchants, converters and consumers were pretty well cleaned up in 1938. The buying policy since the middle of 1938 has been pretty much on the 'immediate requirement' basis. I cannot recall when we have gone into a new year with a better situation as to inventories on the part of the public."

Speaking from the standpoint of the opportunities offered in the paper industry today, Mr. Everest believes there is an unlimited field of endeavor for youth. He points out: "We need more technicians working on new uses. Too many of the things which develop into new uses come from engineers outside the industry not altogether familiar with the things paper and paper products can and cannot do." It is in the field of research, he believes, the young man can find a lasting and lucrative profession.

This month Mr. Everest celebrated his thirty-ninth anniversary in the paper industry. He began in January, 1900, as office boy for the Bryant Paper Company, Kalamazoo, Mich. The untimely death of his father made it impossible for him to complete his education beyond high school, and he therefore learned all he knows about the paper industry from experience.

His first executive position was as assistant manager of the Munising Paper Company, Munising, Mich. He then became manager of Williams-Gray Company in Chicago, a position he left in 1909 to join the Marathon Paper Mills Company at Rothschild, Wis. He has served as vice-president and general manager for many years, and at the company's last annual meeting was elected president to succeed C. C. Yawkey, who became chairman of the board.

Mr. Everest is also president of the Ward Paper Company, Merrill, Wis., secretary-treasurer of the Tomahawk Kraft Paper Company, Tomahawk, Wis., and a director of the Wausau Paper Mills Company, Brokaw, Wis. He is also vice-president of the Institute of Paper Chemistry, Appleton, Wis., a trustee of Lawrence College, Appleton, Wis., with which the Institute is affiliated, and in 1937 served as president of the Wisconsin Manufacturers Association. He served as president of The American Paper and Pulp Manufacturers Association from 1926 to 1929, and was elected to that office again last year.

Aside from his hobby of collecting and cataloguing old books, Mr. Everest enjoys hunting and fishing. He makes long treks into the Canadian wilds after moose, and tries his luck at game fish off the coast of Florida. He is a member of the Wausau Club, the Milwaukee Athletic Club and the Wausau Country Club, a high ranking Mason and a prominent churchman.

Isolation of Legnin Held of Great Importance

A tremendous future source of income is predicted for pulp mills through the successful culmination of many years of work by Dr. F. E. Brauns, research associate of the Institute of Paper Chemistry, Appleton, Wis., which has led to the isolation of lignin as it occurs in wood.

Investigators have been trying to solve the lignin problem for the last fifty years, but up to the present time no one had succeeded in isolation without using such strong acid or alkali reagents that it was changed from its native state. Dr. Brauns has been able to isolate native lignin without acids or alkali reagents which would destroy its natural properties. This contribution is of great importance not only to pure chemistry but to applied chemistry in the paper industry, because lignin has always been a waste product. Only a small amount has been utilized in the manufacture of vanillin, as a road binder, as a tanning material, and as a source of yeast. Methods can now be devised to provide other uses for lignin, turning waste into an important source of income.

Dr. Brauns joined the staff of the Institute in 1935, coming from McGill University in Montreal. Before leaving Germany in 1930, he was chosen to do research work with Dr. Emil Fischer, one of the world's best known organic chemists, in his laboratories at the University of Berlin.

Arthur Ratcliff Heads Hummel & Downing

Arthur Ratcliff, who was recently made president of Hummel and Downing Company, Milwaukee, Wis., has been associated with the company since 1921, when he joined with the late president, John L. Barchard, in building up a greater mill output of fiber containers. The mill now employs 600, and is producing cartons by the millions.

Mr. Ratcliff started his career as a bookkeeper in a real estate office in Chicago. Later he became affiliated with the Container Corporation of America and worked up to the job of running its paper mill.

Joseph A. Staidl Goes to Southern Kraft

Joseph A. Staidl, Appleton, Wis., who has been pulp mill superintendent for Thilmany Pulp and Paper Company, Kaukauna, Wis., for the last ten years, will become associated with the Southern Kraft Corporation at Camden, Ark., after February 1. He expects to take with him as his bride Miss Marion Hodgins of Appleton, Wis., whose approaching marriage was announced by her parents last week.

Sales Volume Increases in Chicago Market

Midwest Trade Improves As Orders Expand In Kraft, Sulphite Bond Papers and Paper Board—Noteworthy Improvement In Paper and Printing Reported By Federal Reserve—Newhouse Acquires Central Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 30, 1939—With reports of improved demand for krafts, boards, sulphite bonds and other products, the Chicago paper market gives evidence of basic improvement as far as the volume requirements are concerned. Business moved into the city at a good pace during the week just past with some lines reporting mills at as accelerated a pace as has been in evidence for some length of time. There remains, however, an unsatisfactory relationship of volume to the price of the finished product and though paper executives here expect prices to be firmer out of a normal development of the supply and demand theory, there continues to be a definite amount of regret that the industry has not as yet coordinated its merchandising program to its production job.

Book papers were reported as less firm during the week as the one grade which diverted from the general statement that markets were firming up along with increased orders. Covers were little changed while local sulphite bond distribution was speeded up materially. The bond and ledger lines were reported uniformly in better demands. Groundwoods were also satisfactory as were newsprints. Krafts reported a spirited demand from many sources which was having some salutatory effect on actual market conditions. Waste papers were in little demand and continued to receive the "soft" characterization from local waste paper circles.

Chicago Men To Address Convention

Two Chicago executives in the paper mill supply field and professional field are listed as speakers on the forthcoming TAPPI program arranged as a part of the congress of the paper industry to be held at the Waldorf in New York City the week of February 20. L. G. Vande Bogart of the Crane Company is scheduled to discuss "Low Alloy Materials For Sulphite Mills" at one of the major sessions while Louis Flader, representative of the American Photo Engravers Association with headquarters in Chicago is to discuss "Photo Engraving and Paper" at one of the sessions designed to promote a closer understanding of mutual problems between paper users and paper manufacturers.

Paper Merchants Get Facts on Costs

Coarse paper merchants in Chicago who are affiliated with the Chicago Paper Association are utilizing the questionnaire method to uncover some needed facts concerning the methods at which they arrive at their selling expense figures. The program is a basic one for the progressive association and was given special treatment at the January 10 meeting of the group when reasons for the questionnaire and for the information were outlined. It was indicated that there were a great variety in methods used as a basis for arriving at selling costs and emphasized that any developments which would aid to standardize the procedure would be invaluable not only to those operating on a scientific basis but to those who were not established on a profitable basis because of erroneous methods of computation. Results of the questionnaire which is now being circulated are to be discussed at the next meeting of the Chicago Paper Association. John L. Richey is the secretary of the Association.

C. E. Roach on Exhibition Committee

C. E. Roach, general paper merchant of Springfield, Illinois, and head of the Capitol Paper Company, is one of a committee of paper executives arranging for exhibits of wrapping paper and paper products which will be staged on the ninth floor of the Waldorf during the February meetings of the paper industry. Mr. Roach reports that there is a considerable amount of interest in the exhibits which have become a major part of the convention week and that numerically as well as from a quality standpoint the displays should surpass those of the past.

Reserve Figures Show Trade Gains

The paper and printing industry showed noteworthy improvement in wage earners and earnings during the month of December according to the most recent survey on business conditions in Illinois, Iowa, Wisconsin, Michigan and Indiana published by the seventh federal reserve district. The 735 paper and printing firms reported a total of 75,937 wage earners for the week ending December 15, a 1.3 per cent increase over November 15. The same firms also listed earnings of $2,211,000 or an increase of 4.3 per cent during the same period.

Newhouse Acquires Central Paper Co.

From the Moline, Illinois, plant of the Newhouse Paper Company, comes the news that the concern with plants at Moline, Des Moines, Minneapolis and St. Paul, has acquired the assets and goodwill of the Central Paper Company of Dubuque, Iowa, and will operate the Iowa concern as a separate corporation. The wrapping paper lines of the Central Paper Company will be augmented by the addition of the printing paper lines specialized in by the Newhouse organization. A. V. Weber, formerly owner of the Central Paper Company, will continue as manager of the new company which will be known as the Newhouse Paper Company of Dubuque.

Norman Ventriss Goes to Hawthorne Co.

It is reported that Norman Ventriss, for a number of years executive secretary of the Western Paper Merchants Association, had accepted a position as sales executive with the Hawthorne Paper Company of Kalamazoo, Michigan. Mr. Ventriss, who has considerable selling experience in the paper industry, will travel extensively in the merchandising of the Hawthorne Durabilt line.

Inquiry Demanded in Lake Sulphite Failure

Member of Ontario Legislature Demands Investigation In Long Lac Water Diversion and Into Collapse of Lake Sulphite Pulp Co. — Abitibi Earnings For December Higher With Current News Shipments Larger.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 30, 1939—Frank Spence, M. P. P., who represents Fort William in the Ontario Legislature, is demanding an investigation in the Long Lac Water diversion, the Ontario government contract with the company which has pulpwood rights in the Long Lac area and also into the collapse of the Lake Sulphite Pulp Company. He charges all indications are that the pulpwood to be floated down the Long Lac diversion is to be exported and not processed in a Canadian mill as promised by the provincial government. He also alleges that one company is getting its wood at government dues much below those charged Canadian companies operating mills in Ontario.

Mr. Spence declares that the action of the government in forcing proration of newsprint output had compelled the Great Lakes Paper Company, Limited, of Fort William, to give up 39,000 tons of its product and that this had been allocated to a Quebec concern. Last year the company had to give up 15,000 tons production and this year must forego a contract for 24,000 tons. Mr. Spence says that the Great Lakes Paper Company had planned to operate to 85 per cent of capacity, and to employ more men during 1939. Instead the mill was operating at only 60 per cent of capacity. Mr. Spence remarks that this proration scheme has wiped out with one fell swoop all the advantages enjoyed by the Great Lakes Company for the manufacture of newsprint. The Great Lakes mill was one of the most efficient in Ontario and after many years of strenous effort it was just entering what appeared to be a profitable period when the Hepburn administration stepped in and dictated not only to the company but to its customers as well where they should buy their newsprint, in this case from a mill in the province of Quebec.

Turning to the Long Lac diversion, Mr. Spence says that 30,000 cords of pulpwood allotted to one company would be floated down the diversion paid for out of public funds. Construction of this diversion meant the end of the rail haul from Long Lac to Nipigon. There were 10,000,000 cords in the Long Lac area and this meant a loss of $40,000,000 potential tonnage swept away right out from under the tracks of the railway. The United States companies to which the wood was to be sent had no need for mills in Ontario but they did need the wood. Mr. Spence adds that it had been reported to him that this wood had been granted for Crown dues of $1.00 per cord while Canadian companies farther inland and subject to long rail haulage were obliged to pay at least $1.40 per cord and, in many cases, $2.00. The former dues in the district were $2.00 per cord. He contended that the whole transaction should be investigated.

George Carruthers Appointed Director

George Carruthers, who is president of the Interlake Tissue Mills Company, Limited, has been appointed a member of the board of directors of Provincial Paper, Limited, Toronto, succeeding the late F. A. Weldon. Mr. Carruthers is a past president of the Canadian Pulp and Paper Makers' Association and also of the Ontario Pulp and Paper Makers' Safety Association.

To Submit Board Report to Government

F. A. McGregor, Commissioner of the Combines Investigation Act, Ottawa, has heard the arguments in the combines inquiry into the corrugated and fiberboard box business. The Commissioner is now preparing a report for presentation to the Minister of Labor which will later be published. During the past few weeks, Mr. McGregor has heard much evidence in regard to the production and sale of corrugated and fiberboard boxes and related products, sittings taking place in Toronto, Montreal and other points.

Abitibi Shipments and Earnings Rise

G. T. Clarkson, receiver and manager of the Abitibi Power & Paper Company, Limited, Toronto, reports that for the month of December the earnings of the company was slightly hgiher than for the comparable month of 1937, for the first time in 1938. Prior to charges for depreciation and bond interest including interest and overdue and unpaid interest, the earnings amounted to $304,284. Earnings in November before depreciation and bond interest amounted to $348,883, and in December 1937 to $280,822. Shipments of newsprint in December, 1938, amounted to 29,313 tons compared with 30,937 tons in November, 1938, and 46,772 in December, 1937. Present indications are that the shipments of newsprint in January will be about 21,600 compared with 18,058 tons in January, 1938. Shipments of sulphite pulp in December, 1938, amounted to 2,806 tons compared with 3,293 tons in November, 1938, and 1,913 tons in December, 1937. Present indications are that shipments of sulphite pulp in January will be about 3,000 tons as compared with 2,150 tons in January, 1938. In 1938, the earnings of the company available for bond interest and depreciation were nearly $3,000,000 as compared with $4,800,000 in 1937. The per ton profit on 324,842 tons of newsprint and sulphite production in 1938 was $9.12 a ton with the newsprint price $7.50 a ton higher than in 1937 and bleached sulphite lower in price, whereas in 1937 the per ton profit on 544,916 tons of newsprint and bleached sulphite was $8.54. In some months of 1938 with higher production than in December the per ton profit exceeded $10. It is encouraging to note from various current reports that an effort is being made by interests representing bonds and junior securities to come to some arrangement, suitable on the whole to all, by which sufficient working capital can be provided and the company returned to its going concern value and earning power on a basis which should be permanent. The terms will be awaited with much interest.

Financial News of Pulp and Paper Industry

Union Bag Employees Subscribe To 30,203 Shares of New Stock Issued By the Company—Directors of Whitaker Paper Co. Declare Dividend—Consolidated Paper Co. To Pay Dividend — Companies Report Profits.

NEW YORK STOCK EXCHANGE

High Low and Last for the Week Ending February 1, 1939

	High	Low	Last
Armstrong Cork Co.	50½	45½	50⅛
Celotex Corp.	17⅜	14¼	16½
Celotex Corp., pf.	69	66¾	68
Certain-Teed Products Corp.	11¼	9⅜	10⅜
Certain-Teed Products Corp., pf.	41⅞	37½	40
Champion Paper & Fibre Co.	26¼	23½	26
Champion Paper & Fibre Co., pf.	100	100	100
Congoleum-Nairn Co.	26½	24¾	25½
Container Corp. of America	14	12⅜	13⅞
Continental-Diamond Fibre Co.	8¾	8	8½
Crown-Zellerbach Co.	13½	12	13⅛
Crown-Zellerbach Co., pf.	86	85¾	85¾
Flintkote Co.	28¼	26⅜	26⅞
Robert Gair	3⅜	3⅛	3⅜
Robert Gair, pf.	11	10½	11
International Paper & Power	12⅜	10¾	11⅞
International Paper & Power, pf.	46	40	44
Johns-Manville Corp.	94½	87	93½
Johns-Manville Corp., pf.	128	128	128
Kimberly-Clark Corp.	25	22	25
MacAndrews & Forbes	30	29¾	30
MacAndrews & Forbes, pf.	125½	124½	124½
Masonite Corp.	49¾	46½	49¼
Mead Corp.	11	9¼	9⅞
Paraffine Companies, Inc.	54½	52⅞	54½
Paraffine Companies, Inc., pf.	100½	100¼	100¼
Scott Paper Co.	46	45¾	46
Sutherland Paper Co.	29	27	28½
Union Bag & Paper Corp.	10⅛	9⅜	9⅞
United Paperboard Co.	5⅞	5¾	5⅞
U. S. Gypsum Co.	101¼	95	100¼

NEW YORK CURB EXCHANGE

High Low and Last for the Week Ending February 1, 1939

	High	Low	Last
American Box Board Co.	7½	7½	7½
Brown Co., pf.	17	15	16
Great Northern Paper	37½	37	37
St. Regis Paper Co.	3	2¾	3
Taggart Corp.	4¾	4⅜	4¼

Union Bag Employees Buy Stock

Employees of the Union Bag and Paper Corporation have subscribed to 30,203 shares, or approximately 15 per cent of the 210,455 new shares of capital stock of the company now being offered to stockholders, it was stated last week by Alexander Calder, president. Subscription rights for employees expired January 21, and are subject to the availability of stock for delivery after exercise by stockholders of rights to subscribe under warrants mailed on January 21.

"We desire to cooperate with our employees and believe that stock ownership is an effective way for employees to share in the fortunes of business," Mr. Calder said. "In accordance with the plan for new financing, certain employees of the corporation were entitled to subscribe to the new stock at the same price at which the new shares are now available to stockholders. In the event that present stockholders do not subscribe to the new issue in full, then these employees may exercise their privilege of 'buying into' the ownership of their company to the extent of the stock then available. At the present time, a considerable number of employees of Union Bag and Paper Corporation are also stockholders in the company." Subscription rights for stockholders to purchase additional stock at $9.50 per share expire at the close of business on February 3.

Whitaker Declares $1. Dividend

A dividend of $1 a share on the common stock of the Whitaker Paper Company has been declared by directors. The regular quarterly distribution of $1.75 per share on the preferred stock also was announced. Both payments will be made April 1 to holders of record March 18.

The company reported net profit of $153,726 for 1938, after provision for Federal taxes. There was earned equal to $3.22 per share on outstanding common stock, after preferred dividend requirements.

At the annual meeting of stockholders, James H. Gilbert, New York, was elected a director, the board being increased from nine to ten. He also was named a vice president of the concern at the organization meeting of directors. C. W. H. Dunbar, New York, also was named a vice president.

The following directors were reelected: H. D. Whitaker, D. E. Barry, H. C. Steward, Charles W. Dupuis, J. W. Dillencourt, B. M. Johnson, B. W. Gillespie, H. F. Hewitt and F. C. Marty.

Consolidated Paper Co. Pays Dividends

MONROE, Mich., January 30, 1939—Directors of the Consolidated Paper Company at the annual meeting, following a stockholders meeting, ordered a dividend of 25 cents a share on common stock, payable March 1 to stock of record February 18. There are over 750,000 shares of stock. The dividend will aggregate $187,000.

H. L. Rauch was re-elected president and general manager. The direct taxes of company during year amounted to $453,177 and company's earnings dropped to $843,385 from $1,583,847.

Seeman Bros. Earnings Up

Seeman Brothers, Inc., report for the quarter to December 31, a net profit of $112,298, equal to $1.04 each on 107,500 common shares, compared with a net profit of $59,871, or 55 cents each on 108,000 common shares, for the quarter to Dec. 31, 1937. The company's fiscal year ends on June 30.

Sutherland Earns $585,146

Sutherland Paper Company for 1938 report a net profit of $585,146, equivalent to $2.03 a share, compared with $804,930, or $2.80 a share, for 1937. Total net sales for the year were $7,324,987, compared with $8,245,045 in 1937.

Pictorial Package Nets $42,217

Pictorial Paper Package Corporation for 1938 reports a net profit of $42,217, equivalent to 40 cents each on 105,700 common shares.

PAPER MANUFACTURERS CONVENE IN MONTREAL

(Continued from page 9)

R. A. McInnis, of Quebec, was unanimously re-elected president for a fourth term, on the motion of Harold Crabtree, seconded by G. Carruthers. Mr. McInnis said that he only took on the task for another year because of the wonderful spirit of the men in the industry and their great co-operation. In a brief presidential address he paid high tribute to the work of the various Sections and Committees of the industry, as indicated by their reports, making special reference to the co-operation and co-ordination of the Woodlands and Technical Sections, which, he said, had proved most valuable. Speaking on the general outlook, he said that executives of Canada's pulp and paper industry must realize that the only way in which production can be carried on is on a basis of competition with the rest of the world, not only as to cost but as to quality of the product.

Outlining the development of the industry since the association was formed 26 years ago, Mr. McInnis declared that at the present time it was the largest employer of labor in the Dominion, and contributed to every phase of national life. Since the pulp and paper industry was now world wide in scope, in Canada strong efforts must be made to secure this country's two principal markets, the United States and Great Britain.

Officials of Sections

V. E. Johnson, of Canadian International Paper, Montreal, was elected chairman of the Woodlands Section in succession of J. O. Wilson, and L. A. Nix was elected vice-chairman. G. W. Phipps and W. G. Wright were elected to vacancies on the council. E. M. Little, of Anglo-Canadian Pulp and Paper, Quebec, was elected chairman of the Technical Section, and new councillors elected were J. C. Nutter, H. Spencer and E. D. Hyndman. A. E. Cadman continues as treasurer of the Sections and as secretary-manager of the association.

Forest Policy

Burt P. Kirkland, principal Forest Economist of the United States Forest Service, in an address before the Woodlands Section on the basis of forest policy in the United States, stressed the necessity, in this country as well, for reforestation on a long-term basis and the immediate cessation of the present liquidation of forest resources. Reforestation in the Southern States, the areas about the Great Lakes and in the northeast had been shown to be economically sound. The most important current movement in the United States was the development of forests on areas which 15 to 25 years ago had been thought to be liquidated for all time, Mr. Kirkland said.

He declared that both Canada and the United States, with forests rich in variety and well distributed with relation to population, had "a unique opportunity not only to supply their own needs but to exchange forest products throughout the world." "While it is perfectly true," he proceeded, "that the United States forests are capable of supplying all domestic needs for temperate zone timber and considerable for export, it does not follow that it is disadvantageous for the United States to trade other products that it can readily produce, such as citrus fruits, for products of Canadian forests.

"Our two countries, being expected to continue of low population density as compared with Europe and Asia, should find large export markets on those continents to take care of any surplus production."

International Movement of Pulpwood

R. S. Kellogg, of the Newsprint Service Bureau, New York, discussing the international movement of pulpwood, said that some 25,000,000,000 cubic feet of standing timber had been exported by Canada to the United States, in various forms, during the past 80 years.

"With Canadian pulpwood and wood pulp always on the United States free list—logs generally free and newsprint paper without duty since 1913—commercial ties and reciprocity of investment in forest enterprises have steadily increased," Mr. Kellogg said. "The prospects are that such ties will become greater and such interests still larger in the future. For 50 years Canadian pulpwood has been coming to the United States; Canadian wood pulp has been used nearly as long; and for 25 years and increasing quantities of Canadian newsprint paper has been taken by United States publishers," he said, adding "It is obvious that without such a large and nearby customer the profitable utilization of Canadian forests would have made much less progress."

The international movement of pulpwood in Europe was difficult to trace accurately because of the differences in official statistics given out by the various countries, and also because of the changes in the economic structure effected by Germany's absorption of Austria and the Sudeten districts of Czechoslovakia, he said.

Germany may get considerably more wood in her further eastward drive and may also come to Canada for pulpwood so long as she can afford or is permitted to do so, Mr. Kellogg suggested.

Russia, with 43 per cent of the total pulpwood exports of Europe is the greatest pulpwood exporting nation on that continent. "North America need not expect direct competition from Russia pulp or paper in the near future," Mr. Kellogg said. "Finland, Norway and Sweden will continue indefinitely to be prominent features in the pulp and paper picture."

Mr. Kellogg suggested there may be considerable increases in the production of pulp and paper for export from Finland and Sweden. "In general it is now more profitable to use spruce for pulp and paper than for lumber," he said.

During the four years from 1934 to 1937, Great Britain imported an average of 77 per cent of her imports from Russia. But her imports from Russia decreased from 131,000 cunits (100 solid cubic feet) in 1935 to 56,000 cunits in 1937.

"Great Britain is now taking less wood than formerly from Russia and according to latest arrangements will probably get more from Newfoundland hereafter than from Russia," Mr. Kellogg said. "Britain's principal source of supply will be Newfoundland."

He added that the forest resources of this continent were approaching an economic unit with common and interdependent markets. It would be to

the industry's advantage if regular reports on North American forest resources and forest use could be made available through co-operation between trade organizations and Government services.

Efforts To Improve Newsprint

Among the many papers on technical subjects that were read at the convention, particular interest attached to one by J. D. Brown, of the Canadian International Paper Company, who spoke of the need for improving the quality of newsprint. He said that newsprint companies are doing research work in an attempt to provide papers with a better quality paper, possibly one that will take color printing, in order to help regain advertising revenues lost to radio and weekly periodicals. He suggested the better quality paper should be produced at the same or even lower costs than present newsprint. "To those of you who have even casually studied the recent trends in newspaper advertising, the losses sustained by the publishers in this direction, with consequent lowering of tonnage purchase from the (newsprint) mills, in favor of radio and weekly periodicals have provided plenty of food for thought," Mr. Brown said. "Just how this advertising can be turned back to the newspapers, thereby placing the (newsprint) industry once again upon a full time or nearly full time basis, is something that is taxing the best brains amongst our production men.

"Broadly, the answer seems to be better quality or paper to take color printing, at the same or even lower costs than are in effect today, and this must be done by improving the groundwood quality to a point where strength, opacity and finish of the sheet (of paper) can be achieved with sulphite finish not exceeding about five per cent. Methods of groundwood mill operation have undergone a considerable improvement in the last few years. It has been possible, as a result, to reduce the sulphite content of the sheet measurably, and this has been a definite step forward . . . But what we have done is as yet a long way from (our) objective."

Dr. Campbell, of the Canadian Pulp and Paper Research Institute, told of efforts being made to discover and counteract the "ageing" of paper made from woodpulp.

Fight Against the Spruce Sawfly

Another subject discussed which was of great interest to all the members was that of the European spruce sawfly which since it was first discovered here in 1930 has created havoc over thousands of miles of spruce forest in Eastern Canada each year. Papers on measures being taken to combat this pest were read by experts in the employ of the Dominion Government, who held out a reasonable hope that the pest might be controlled. R. E. Black, of the Dominion Entomological Laboratory at Fredericton, N. B., said that the only hope of a permanent check to the outbreak still seems to be in the establishment of effective parasites. He said several parasites had shown ability to combat the sawfly, but studies must be made for several years before reliable information as to the extent of their ability to do so was gained.

A. B. Baird, of the Dominion Parasite Laboratory at Belleville, Ont., told of parasitic work done in Canada, Britain, United States and Europe. "With the continued co-operation of all interested parties there appears reasonable hope of saving the spruce forests from destruction by this insect," he said.

Hints at Nazi Propaganda Against Canadian Newsprint

The Hon. Peter Heenan, Minister of Lands and Forests, in a luncheon address, said that propaganda in the United States concerning the state of the Canadian newsprint industry "has all the appearance of promoting the use of German newsprint."

"From discussions with American publishers I find they are suspicious that if the time ever comes when the Canadians have an opportunity to take advantage of the situation, they will raise prices beyond that which is reasonable," he said. "I feel it is your duty to assure them that no matter what has transpired in the past, you will not take undue advantage of any particular condition to be unfair. I feel equally sure that the American publishers will agree that too low a price is not fair to the investor, the workers who produce the material and the people who own the natural resources."

The government's burden in regard to the newsprint industry was to protect the national resources and thus ensure conservation, to see labor was treated fairly, to look after government revenues, and ensure "a just and adequate distribution of labor."

The last-mentioned aim had been misinterpreted and misrepresented by "those who are perhaps prompted by selfish motives." No fair-minded person would object to the government's aim to maintain fair wage levels in the industry. Publishers would realize there must be a fair revenue to the government that spends the taxpayers' money protecting the forests.

"We have a large number of mills in Canada and they were all required at one time, even as late as 1937, to supply the necessary demand. Is it not fair that when the market falls off the labor required should be distributed as equally as possible? Yet we find propagandists who do not hesitate to spread false information that in Canada we are doing this in order to keep many inefficient mills in operation and they have suggested that if we operate only what they term efficient mills, they might get their newsprint at a lower price. Let me say that there is no pro-rating of tonnage or division of labor among what those propagandists are pleased to call inefficient mills. All mills under this system are reported on by eminent engineers and their reports are not questioned by anyone but . . . those propagandists."

Referring to the propaganda that he thought was designed to promote the use of German newsprint in the United States, Mr. Heenan asked where was more regimentation to be found than in Germany?

"But even among our producers in Canada we have some who through selfish interests would take advantage of this false propaganda rather than make an equal sacrifice with the rest of the industry. However, I rely on the good judgment of the American publishers and trust they will not be misled."

Chemical Pulp Section

F. G. Robinson, chairman of this Section, reported as follows: During 1938, contrary to experience over many years, the Chemical Pulp Industry had to cope with dislocation of business not alone in one or two markets but in all markets. The shrinkage in consumption coincident with the recession of business in the United States during the latter months of

1937 was soon followed by almost entire cessation of shipments to Japan—a large consumer. Soon thereafter international unrest in Europe affected consumption adversely, first in Continental Europe and then in the United Kingdom.

Some improvement in business began to show itself in the United States about mid-year, but in Japan, Europe and the United Kingdom conditions improved but little and continue unsatisfactory at the year end. When demand fell off towards the end of 1937 producers in North America promptly curtailed their operations to obviate the tying-up of the liquid resources in unsaleable inventories of manufactured pulp; by this means such employment as consumption would support was spread over a longer period than would otherwise have been possible. The pursuance of this sound policy throughout 1938 contributed also to steadiness in the markets for those papers and paper products for which chemical pulp is the principal raw material.

Unfortunately, this policy was not pursued by European producers, who persisted in continuing shipments to the United States at a rate in excess of current or prospective consumption. This led to speculation and trafficking that should not exist in the paper industry as to its basic raw materials. The evil effects of long-term price fixing and resulting speculation, to which we have referred in our annual reports for several years past, were demonstrated. The more orderly state of affairs in the chemical pulp industry as to competition from European producers, which seemed a possibility when our report was submitted last year, has not materialized.

At the year-end the industry was taken by surprise by the elimination of all customs duties on pulp of all kinds entering Canada from all producing countries of any importance, commencing January 1st, 1939. This results from the application of the terms of the new Canada-United States Trade Treaty to European countries having "most favoured nation" treaties with Canada, and creates many serious and widespread problems. There has not yet been opportunity to survey these problems fully and to determine what remedies should be applied; but these matters are being actively considered with a view to formulating action that will be in the best interests of the industry.

The Light-Weight Specialties Section

Reporting for this Section, G. L. Carruthers, chairman, said that while there had been and still were some disturbing factors in the domestic situation, the demand for light-weight sulphite papers in 1938 was fairly steady. The tonnage was approximately equal to that of 1937, but there were price reductions which made the returns less than had been expected at the beginning of the year.

The Mechanical Pulp Section

D. G. Kibbey, chairman, reported as follows: The first of Januay 1938 found stocks of mechanical groundwood on hand at the Canadian producing mills practically double that of the preceding year. This condition should have been a warning to the groundwood mills but no extensive curtailment was made effective. Production of paper in the United States and the United Kingdom sloughed off rapidly during the early months of the year and groundwood sales met with increasing competition of side-run news and various grades of waste paper.

During the first ten months prices dropped more or less rapidly, declining approximately $8.00 per dry ton in the United States and the selling price from 65 to 45 shillings per wet ton in the United Kingdom. The mechanical pulp mills in Norway. Sweden and Finland curtailed production during the year and many of the Canadian mills established a policy of producing only a sufficient quantity to fill orders.

Consumption of groundwood started a slow upward climb in August. Stocks on hand have been reduced, which has resulted in a more favorable situation at the end of the year. The market prices indicate a slight upturn for the beginning of 1939. Improved conditions are anticipated in 1939 but groundwood prices will probably remain more or less stationary until a general increase in chemical pulp prices is made effective.

The Tag Section

N. E. Wainwright, chairman, reported that business throughout the year had been fairly good. With respect to the new U. S. A.-Canadian trade treaty, he said. "This necessitated certain adjustments in price, which have now been made, and it is hoped that the greater volume of business that is likely to develop throughout Canada will result in additional tonnage for the grades made by the mills in this Section, with the hope that the reduction in price will be offset by the lower operating cost, which might be achieved due to the anticipated extra and improved business."

The Tissue Section

George Carruthers, chairman, reported as follows: There are seven Canadian mills engaged in the manufacture of tissue and tissue specialties. This is the same number of mills as reported last year. In addition to these mills there are now in Canada three toilet-tssue converting plants, that is, one more than reported last year. There is also a new plant converting towels and napkins. As usual, there is a certain volume of tissue specialties being imported, particularly in the cheaper lines, and while it may be assumed that the various tissue firms got their share of available business, on the average the volume indicates that the consumer purchasing power for 1938 was not as great as that of 1937.

Under the terms of the recent Trade Treaty which was made between Canada and the United States, our good neighbors to the South reduced their tariff against Canadian tissue specialties by 50 per cent, but the duty is still sufficiently high to effectively bar our tissue specialties from the United States market. However, in view of the prospect of a general improvement in business conditions, the probabilities are that the sales for 1939 will show an improvement over those of 1938.

The Wrapping Section

C. H. Fetherstonhaugh, chairman, reported that the tonnage for the year 1938 was down about 6 per cent from 1937. He continued: The productive capacity of the Canadian wrapping paper mills still far exceeds the Candian demand but, by co-operation, conditions have remained stable.

The position of the Canadian wrapping paper industry has not been improved by the reduction in duty on wrapping paper arising from the trade agreement (signed November 17, 1938) between Canada and

the United States of America; the rate of duty on wrappings prior to the said treaty (imported from the United States into Canada) being 30 per cent and 3 per cent excise tax, whereas under the treaty, effective 1st January 1939, the rate of duty will be 25 per cent and furthermore, by legislation, it is proposed to abandon the 3 per cent excise tax. Because of the great uncertainty arising from the unsettlement in world conditions, it is very difficult to prognosticate as to the year 1939 but barring general upheaval, it is reasonable to express the hope that the demand in Canada, in the year 1939, will equal that for the year 1938.

The Traffic Section

T. H. Weatherdon, chairman, detailed the activities of this Section in relation to international class rates, to the Canadian railways, to export rates to the Atlantic seaports and to harbor dues and top wharfage. In closing he emphasized the importance of the work of traffic representatives, saying: "May we solicit, on behalf of your traffic representative, your co-operation in getting for his profession the recognition, which, in order to best serve your needs, it should receive. Steps are underway to form a Canadian Institute of Traffic Management, through which ambitious traffic managers may not only advance in ability, but also make available to you a means whereby their technical knowledge may be measured. Probably no other department in your organization is in so vital a position to help control costs, yet it is feared that it is often looked upon only as a necessary evil. Ask him to give you a report on what his department accomplished during the past year and we believe you will be agreeably surprised."

The Technical Section

G. I. Hoover, chairman, reported an active and successful year, with an increasing membership by 25 to a total of 311. He told of valuable work done by twelve different committees, and continued in part:

Two new committees were formed during the year, the Alkaline Pulping Committee and the Wood Chemistry Committee. The Alkaline Pulping Committee has just been formed and should in the years to come render valuable service to this branch of the Industry which is faced with increasing competition from the South. The Wood Chemistry Committee was formed to study and report upon the fundamental chemical discoveries in the field of pulp and paper which are constantly being made in the various laboratories of the world, and which have possible application to our Industry. In particular this committee has recently examined very thoroughly the fundamental chemical investigations being carried out at the Pulp and Paper Research Institute and has reported fully upon this work to the Council. Through the efforts of this committee it is hoped that the results of these researches may more quickly be brought to practical application and moreover that certain of the investigations may be directed along more practical lines.

The Engineering Committee has continued to distribute its very valuable data sheets and has widened its activities by forming local sub-committees in various districts. The Waste Committee has made considerable progress in its preliminary attack on this extremely important problem. This committee has recommended that the services of a full-time research worker be engaged at the Institute and this recommendation has been forwarded to the Joint Administrative Committee.

Arrangements were completed whereby the Technical Section will pay the travelling expensese of a limited number of speakers from the staff of the Research Institute for the purpose of addressing interested groups of men from the Industry residing at considerable distance from Montreal.

In 1938, the services of a translator were engaged and at monthly intervals since that time, abstracts of various articles appearing in foreign language periodicals of possible interest to the Industry have been sent out to members of the Technical Section requesting this service.

The Technical Section Council wishes to go on record at this time to the effect that it unanimously believes in the value of the Research Institute to the Section and to the Industry in general. It has trained a large number of men for the Industry, it has provided many ideas of value to the Industry and it is ready at any time to carry out investigations of interest to the Industry.

The Woodlands Section

J. O. Wilson, chairman, reported that this Section now had 186 members and during its existence had published close to 500 papers and reports. He detailed the extraordinary variety of work, investigation and instruction in which the Section had been active during the year. He proceeded:

"Looking over the work of this Section to date, there is ample evidence that an enormous amount of work has been accomplished and the advances in logging methods, which have been made since the Section was organized, bear ample testimony to the efficacy of the tremendous amount of effort which has been put into the work of this Section.

"The outlook in connection with Woods Management is however, rapidly changing; due partly to changes in the standards of bush labour and legislation connected with this and partly to the inevitable trend of operations towards more inaccessible stands, operating costs are rising out of proportion to the price obtained for the finished products of the Industry. As a result of this, further efforts are called for in order to keep these costs down within the economic limits allowed by the general price structure of the Industry. There is a tendency to look for these economies in two directions: 1. Greater mechanization and better organization and control of logging operations. 2. Long-term forest management based on conservation and sustained yield operations.

"Both these tendencies call for changes in woods organization and this Section has a vital function to perform in arranging for the necessary investigations and research work.

"Of the many problems calling for investigation, the following are typical: 1. The possibilities of introducing more mechanical equipment into our logging operations in Eastern Canada. Coupled with this there should be a search for cutting methods best calculated to promote natural reproduction and sustained yield management. 2. We should study the problem of Wood Transportation in order to find more efficient methods of handling and transportation of pulpwood both by land and water. 3. Economic studies with special reference to the fuller utilization

of all the forest products resulting from sustained yield forest management."

Mr. Wilson set forth the proposals of the Section for dealing with these problems.

The Research Institute

Harold Crabtree, chairman of the Joint Administrative Committee of this Institute, which is maintained by the Association, the Dominion Government, and McGill University, detailed the work of the Institute during the year. He said that in addition to the more academic and fundamental studies made in the course of student work, research has proceeded along three main lines; the study of the groundwood process, of the sulphite process, and of the basic principles governing the application of printing ink to paper. In all these directions steady progress is being made.

In addition to research work proper, the Institute has done work of considerable value under the head of "Technical Service." This includes such work as is referred to the Institute by member companies when it cannot be done in their own laboratories for various reasons. Such reasons are the desire to check their own methods or apparatus or when no apparatus is available to perform some unusual test or when independent test results are wanted. Approximately 800 jobs of this nature were done during the year. The Institute performs a considerable amount of inspection work in connection with testing apparatus for which the Technical Section have set up standard requirements. About 75 jobs of this kind were done during the year on apparatus purchased for use in the industry.

Forest Products Laboratories

H. Wyatt Johnston, the officer in charge of these laboratories, gave a detailed and technical description of an extraordinary variety of work accomplished in process. Among his announcements were the following:

The Canadian rights to the Johnson pulp classifier have been assigned by the inventor to the Canadian Pulp and Paper Research Corporation with the assent of the Government. A complete installation for analyses of woods and wood pulps has been set up. Typical kraft pulps from mills in Canada and the Southern States were evaluated by the T.A.P.P.I. standard beater test. In the unbeaten state Canadian pulps were stronger than the Southern pulps, but the latter developed a good strength.

A miniature printing press has been designed and constructed in an attempt to arrive at a numerical measure of printing quality. Preliminary experiments show encouraging results. Mechanical pulps were prepared from loblolly, longleaf, shortleaf and slash pines using the miniature pulp grinder. The pulping characteristics of these woods appeared to be inferior to spruce, even after pre-treatment with heat and chemicals.

Preliminary experiments with a modified form of the sulphite process have resulted in increased yields of usable pulp. The work is being continued to find out what range of pulp qualities can be obtained and what technical difficulties are likely to be met in practical application of the modified process. An interesting industrial investigation was conducted by H. R. Peterson and T. L. Crossley using the experimental pulp and paper mill. Young twigs and prunings from fruit trees were pulped, unbarked, by the soda process, bleached and made into good book papers with slight addition of long fibered pulps. Pulp from a later series of experiments was sent to a commercial mill and converted into a high-grade cigarette tissue.

Division of Industrial and Cellulose Chemistry

Dr. Harold Hibbert, Professor of Industrial and Cellulose Chemistry at McGill University, in a report to the Administrative Committee of the Pulp and Paper Research Institute, said:

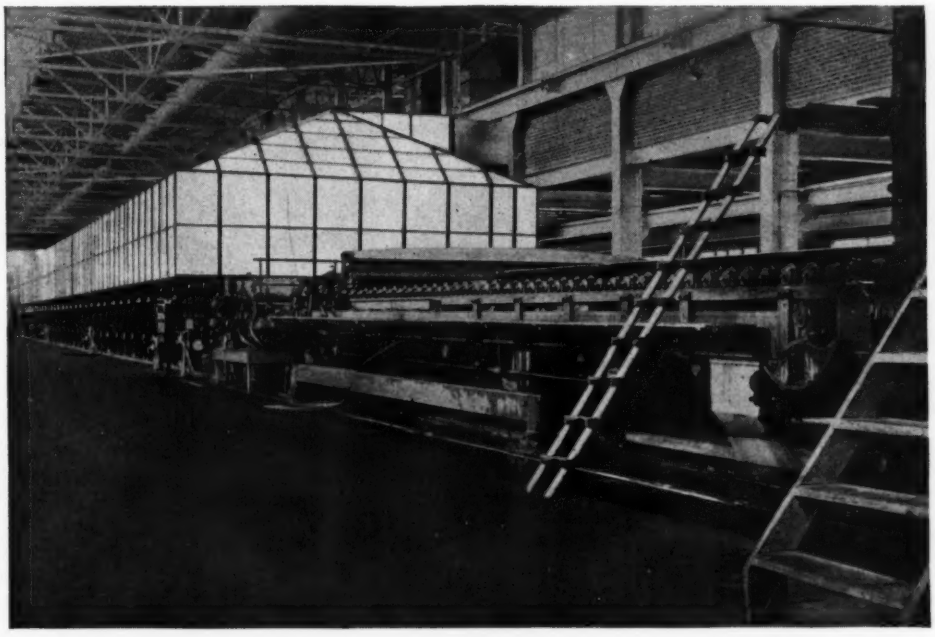
"The session of 1937-1938 has been devoted very largely, as in the previous year, to investigations relating to the structure of lignin and it is a pleasure to be able to report that the solution of this problem now appears to be well in sight. In view of the results of our most recent investigations, it would seem that lignin is essentially an aromatic substance consisting of an aromatic nucleus (namely the guaiacol radical in the case of softwoods, and both the guaiacol and syringyl radicals in the case of hardwoods) attached to a 3-carbon side chain represented by a hydroxy ketone. The difficulties encountered hitherto in the studies of lignin have arisen from the extraordinary reactivity of this aliphatic side chain.

"We have been able to isolate this building unit and to show that it readily undergoes condensation reactions to give what are apparently the typical "extracted" lignins. It is now possible to remove as high as 40 per cent of the native unchanged lignin in the form of distillable oils for which there is reason to believe a wide application will ultimately be found in the chemical industries. In addition to this 40 per cent of the lignin we are now able to obtain another 30 per cent in the form of distillable oils by reduction of the extracted lignin with hydrogen at high pressures. In other words, a minimum of 70 per cent of the so-called "Klason" lignin can now be isolated in the form of products likely to be of considerable value in the chemical industries and it is confidently expected that this ratio can be increased to around 85 per cent. These discoveries may exert a profound effect on the future of the pulp and paper industry in that they raise at once the question of how far solvent extraction will, in a relatively short time, displace other processes in the pulp mill and even in the grinding of wood. It is understood, for example, that experimental large-scale pulping operations employing butyl alcohol are already under way in the United States.

"Your Wood Chemistry Committee has reported, and the report is concurred in by the Chairman of the Administration Committee, that these developments represent only longe-range possibilities from the point of view of their influence on the status of the industry. I would be failing in my duty to the Association were I not to point out that such views are in my opinion likely to prove erroneous, and that putting aside any natural optimism and enthusiam, it is my considered opinion that most probably within the next five to six years there are likely to be fundamental changes in the manufacture of pulp and paper and that such developments are likely to accrue to the sole benefit of the Southern States' industries unless adequate attention is given to the effect of this development on the Canadian situation.

"I wish to emphasize that this is not an alarmist view but one based on the results of twelve years' investigations and also on a personal, intimate acquaintance with conditions in Europe, not only insofar

ANOTHER BELOIT MACHINE



THIS FINE PAPER MACHINE IS THE PRODUCT OF THE MODERN ENGINEERING AND MANUFACTURING FACILITIES WHICH MAKE BELOIT THE LEADER IN MEETING THE EXACTING DEMANDS OF THE PAPER INDUSTRY

THE BELOIT WAY BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS. U.S.A. **IS THE MODERN WAY**

as they relate to improvements on the scientific and technical side but also in regard to actual sources and supplies and rate of growth of raw materials. It is to be hoped that those responsible for the guidance of the affairs of the Association may give this matter the attention it deserves.

"It should also be pointed out that the United States Government, acting through the Department of Agriculture, is about to undertake the erection of four large research institutes in different sections of the United States for the purpose of carrying out intensive research work on products of the farm and presumably of the forest. Each of these is to receive one million dollars per year for research and while it would be somewhat unsafe to predict what developments are likely to arise from the expenditure of this vast amount of money, the writer believes that, if work is to be carried out on such a scale and is to included utilization of wood, the results will exert a very marked effect on the future economic status of the Canadian lumber, pulp and paper industries. In fact, with a ratio of tree growth advantage represented by four or five to one in favour of the Southern States, the effect of such concentrated research is likely to lead to developments which may possibly threaten the actual existence of a future Canadian pulp and paper industry."

Book and Writing Section

R. H. Ecclestone, chairman, reported that the manufacturers in this Section had had a difficult year through market conditions over which they had no control. Due to depressed prices in other countries, particularly in the United States, Canadian prices had to be reduced and the mills finished the year with little hope for immediate improvement. Despite the fact, however, that the twelve months produced a buyers' market condition, and foreign competition was very keen, the mills weathered the storm in a very satisfactory manner. The brightest spot at the moment is that inventories are very low and that the slightest improvement in general business conditions will almost immediately result in improved sales.

Joint Textbook Committee

Royal S. Kellogg, secretary, reported that the four-year job of revising the textbooks issued by the Association had been completed. During the 20 years since the work of producing these textbooks began, "the industry itself has contributed $57,000 to the undertaking, the Committee has spent $78,000 in total and has over $3,000 left. This is a nest-egg which will steadily increase from royalty receipts during the next few years and undoubtedly be large enough when the time comes to meet the expense of still further revisions of the textbooks. In other words, the work of the Committee appears to be continuous and self-sustaining as it should be in an industry which is steadily improving its products and processes through the application of the results of scientific research."

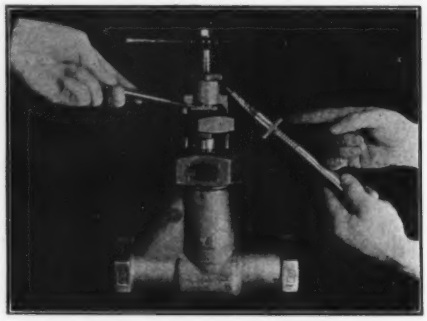
To Distribute Corroflex

The Pierce Paper Company, 312 Park avenue, Rockford, Ill., has recently been named one of the distributors of Corroflex, a flexible cushion wrapper, manufactured by the Sherman Paper Products Corporation, Newton Upper Falls, Mass.

Improved Hancock Steel Valves

The Hancock Valve Division of Manning, Maxwell & Moore, Inc., Bridgeport, Connecticut, announces an important (design) improvement of Hancock forged and cast steel valves.

This advancement incorporates both the construction and materials used in a renewable stem thread bushing. Hancock now makes this vital part of Duronze (an aluminum, copper, silicon alloy). The makers claim that these new bushings completely meet the demands for valves that will operate satisfactorily without lubrication of the stems at elevated pressures and temperatures. Users dislike to lubricate valve stems under these operating conditions because the grease or oil picks up construction dust, fly-ash or pulverized coal which act as abrasives and wear away stems and bushings.



HANCOCK VALVE WITH DURONZE BUSHING

The makers state that Hancock Steel Valves equipped with these Duronze bushings outwear many times valves not having such parts. These bushings have an exceptionally low coefficient of friction, a very high resistance to wear and corrosion, plus a tensile strength of 90,000 lbs. Should it ever become necessary, this bushing can be economically replaced thus saving the cost of a new valve stem and bonnet.

The selection of this particular alloy for this purpose came after extensive tests run off in one of the country's large utility plants. Bushings of various materials and designs were tested on turbines operating on steam of 670 pounds and 820 deg. F. Breakdown tests were performed by attaching reversible air drills to the valve handwheels. The makers report that these alloy valve bushings selected, still showed no signs of wear after 5 times the number of operations required to destroy bushings of other materials.

New illustrated bulletins describing these improved Hancock Steel Valves sent on request.

Waste Paper Firm Opens at Charlotte

CHARLOTTE, N. C., January 27, 1939 — A local branch of the Chesapeake Paper Stock Company of Richmond, Va., dealers in waste paper, has been opened here in the large warehouse building on the Southern Railroad between W. Trade and Fifth Streets.

The establishment will employ about 25 persons. J. C. Watkins, president, and W. H. Boyd, secretary-treasurer of the company, are in Charlotte making plans for setting up the required equipment and beginning operations.

Prominent Men Sponsor Festival

Prominent executives in the paper industry over the United States will serve on the advisory committee for the First Annual Southern Paper Festival to be held at Savannah, Ga., April 17-18-19. Ten Southern Governors also have accepted places with the advisory group, as has James G. Stahlman, published of the *Nashville Banner* and president of the American Newspaper Publishers' Association and Robert Fechner, director of the Civilian Conservation Corps.

A host of state and federal officials and seven forestry associations have also pledged their cooperation in making the Festival an outstanding Southern celebration, designed to encourage forestry conservation and promote the use of paper and allied products.

Forestry groups which have indicated their desire to cooperate are: Slash Pine Forestry Association, Georgia Forestry Association, Florida Forestry and Park Association, Mississippi Forestry Association, North Carolina Forestry Association, Texas Forestry Association and Tennessee Forestry Association.

Some of the Paper Company president who have accepted to date are: E. L. Kurth of Lufton, Tex., president of Southland Paper Company; S. A. Williams of New York, president of Johns Manville Products Company; I. J. Harvey of New York, president of Flintkote Company; J. C. Twinan of Chattanooga, president of O. B. Andrews Company; C. R. Dunham of Wilmington, Del., president of Hercules Powder Company; R. S. Crump of Richmond, Va., president of Standard Paper Manufacturing Company; Rueben R. Robertson of Canton, N. C., president of Champion Paper and Fibre Company; Col. C. W. Gaylord of Bogalusa, La., president of Gaylord Container Corporation; J. E. Kelley of Hodge, La., president of Southern Advance Bag Company; J. P. Hummel of Hopewell, Va.; president of Hummel Ross Fibre Company; Alexander Calder of New York, president of Union Bag and Paper Corporation; C. R. Van de Carr of Chillicothe, Ohio, president of St. Joe Paper Company and Brunswick Pulp and Paper Company; B. Alexander of Laurel, Miss., president of Masonite Corporation; Samuel Kipnis of Jacksonville, president of National Container Corporation; James L. Coker of Hartsville, S. C., president of Sonoco Products Company; H. H. Strauss of New York, president of Champagne Paper Corporation and Ecusta Paper Company, and S. L. Wellhouse of Atlanta, president of National Paper Company.

A Technical Meeting will be sponsored by the Southern States Pulp and Paper Club, and various trade associations will hold group meetings also.

Chase Bag Factory Nears Completion

A new bag factory being constructed for the Chase Bag Company in Portland, Ore., is nearing completion. Designed and built by the Austin Company, the new Chase plant is a modern one story concrete structure, housing approximately 67,000 square feet, and it is expected to be in operation some time in February.

The project, representing a sizable investment, is ideally located with respect to raw material sources. The plant will supplement other Chase Bag Company factories by rendering service and distribution to bag users throughout the Pacific Coast and Rocky Mountain States.

UNITED PIGMENTS
Pure Titanium Dioxide
UNITANE-O

A brilliantly WHITE, pure titanium dioxide possessing excellent . . .

•OPACITY

•BRIGHTNESS

•DISPERSION

Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces *whiter* sheets of *great brilliance*, and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request.

UNITED COLORS & PIGMENTS

UNITED COLOR AND PIGMENT CO.
DIVISION OF INTERCHEMICAL CORPORATION
NEWARK, NEW JERSEY
SALES OFFICES IN PRINCIPAL CITIES

Obituary

William P. Bradbury

William P. Bradbury, 53, vice president and general sales manager of the Consolidated Ashcroft Hancock Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., died of pneumonia after a six-day illness, on Saturday, January 14.

Mr. Bradbury joined Manning, Maxwell & Moore, in 1902 as an office boy. His willing energy and cheerful personality advanced him step by step through various positions in the sales department. These assignments took Mr. Bradbury to every part of the United States and some foreign countries. In 1923, Mr. Bradbury was made general sales manager and in 1930 vice president in charge of sales, the position he held until his death.

The scope of Mr. Bradbury's sales activities ranged completely across American industry. During the past quarter of a century there has scarcely been a public utility or any other major power plant built in which he has not rendered a helpful service. Similarly, Mr. Bradbury numbered as his friends hundreds of distributors and their salesmen. To all his relations with people he brought a sympathetic understanding and kindliness that has been largely responsible for the remarkable growth of his company, Manning, Maxwell & Moore.

Francis W. Warren

[FROM OUR REGULAR CORRESPONDENT]

BROWNVILLE, N. Y., January 30, 1939 — Word reached here this week of the death in France of Francis W. Warren, internationally known as a consulting engineer for paper mills. He was born in this village in 1880. His rise in the paper industry was rapid and at the age of nineteen he was superintendent of the Deferiet mill of the St. Regis Paper Company. His ability was recognized in 1900 by the late David Anderson who sent him to Sweden where he constructed and placed in operation the Frovifor Mills at Frovi. After that he returned and was engaged by the Frost Paper Company, of Norwood, as general superintendent. Later he went back to Europe where he was in charge of paper mills in Paris. Returning to this country he became associated with the Harmon Paper Company and the Brownville Paper Company. He was also associated with the Warren Parchment Company, of Dexter, which was organized by his brother, John J. Warren.

John Leslie

John Leslie, 77, founder and chairman of the John Leslie Paper Company, general paper merchants, Minneapolis, Minn., died at his home at 1901 Irving avenue S., on January 20 after a short illness.

Mr. Leslie was born in Bally Bay, Ireland and after several years of employment with wholesale paper and stationery firms in Ireland, he came to this country in 1884 to join his family who had settled in Mitchell, S. D. A few months later Mr. Leslie came to St. Paul and was associated with Averill, Russell & Carpenter, general paper merchants, from 1885 to 1894. In 1888 he was married to Bessie M. McAfee and lived in St. Paul until he established a Minneapolis branch of his firm. In 1894 Mr. Leslie formed the partnership of Leslie & McAfee which was incorporated as the John Leslie Paper Company in 1900; the company now having branches in St. Paul and in Great Falls, Mont.

Mr. Leslie was active in the formation of the National Paper Trade Association and became its president in 1912. He was also instrumental in forming the orginal Merchants Advisory Committee of the Hammermill Paper Company. He was active in the paper trade and aided in the development of the Minneapolis and Northwest trade territory. He was a member of Hennepin Lodge No. 19, A. F. & A. M., the Scottish Rite Masons and Zuhrah temple of the Shrine. The honory thirty-third degree of the order was conferred on him shortly before the World War. Mr. Leslie was also a member of the Hennepin Avenue Methodist Church and of the Minneapolis Club.

Surviving are his widow, four sons and fifteen grandchildren.

Robert M. Clements

Robert Muir Clements, president of the Clements Paper Company, general paper merchants, Nashville, Tenn., died January 22 after a short illness.

Mr. Clements was born in Evansville, Ind. and came to Nashville with his parents when a young man. He began his business career with Morgan-Hamilton, bag manufacturers, which later consolidated with the Werthan Bag Corporation. In 1911 he organized the Clements Paper Company and directed its affairs up to his death. He was a communicant of the Cathedral of the Incarnation. Mr. Clements traveled extensively in Central and South America and made a tour of northern South America last year.

Surviving are two sons, three daughters and a brother, C. Runcie Clements, president of the National Life & Accident Insurance Company.

Funeral services were held at the family home, followed by a high requiem mass at the Cathedral of the Incarnation. Burial was in Calvary Cemetery.

S. Daniel Stacy

S. Daniel Stacy, 53, superintendent of the American Box Board Company, Grand Rapids, Mich., died on January 13 at the Butterworth hospital where he had been a patient for nearly a week.

Surviving are his widow, a son, Samuel, of Grand Rapids, a daughter, Mrs. Vertner Rose of Mt. Pleasant, and three grandchildren.

Funeral services were held at the Greenhoe chapel and burial was in Rest Lawn Cemetery.

Duncan T. H. MacKinnon

[FROM OUR REGULAR CORRESPONDENT]

MENASHA, Wis., January 30, 1939—Duncan T. H. MacKinnon, 86 years old, died at his home at 360 First Street, Saturday night, January 21. He was a prominent industrialist of the Fox River Valley, and for a number of years was actively connected with the former Island Paper Company here. He was born in Lymington, Hampshire, England, April 7, 1852. He moved to Menasha in 1870 and had lived there ever since. Private funeral services were held.

Indianapolis Is Optimistic

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., January 30, 1939—There is considerable optimism and a strong undercurrent to the paper market here. On every hand there seems to be a well-defined opinion that business during the current year will become better. The fact that Congress is in session, with all the uncertainty concerning legislation, and the fact that the Indiana Legislature is in session, also with possibilities of increased taxes and other complicated legislation, appear to have no bearing on what the trade believes will happen this year.

For one thing, demand for newsprint has continued heavy. Advertising lineage is above the same time a year ago and likely will continue to improve as the spring season approaches. Printers and advertising men say they have a lot of work in prospect. Prices have shown no change in this section.

The fine paper demand holds steady. Covers, books and ledgers all are in far demand, though the market does not show the same proportionate increase as has been shown in some other lines of the field. Prices are firmly held, however.

Demand continues for all grades of building papers. There will be a steady demand, it is predicted, until the spring building season starts when a big rush is looked for. Most of the dealers are buying only for current needs, since March 1 is assessment time for taxation purposes, and they don't want a lot of stock on hand at that particular time.

Box factories gradually are increasing their production. Business has not assumed the volume it had during the holiday rush, but there is nothing to worry about, according to executives. Users are limiting their purchases to immediate needs. After the first of March it is expected some stocks will be built up. At present they are very low.

There has been no change in the paper stock situation. Mill demand is rather indifferent.

Ohio TAPPI To Hold Joint Meeting

The Ohio Section of the Technical Association of the Pulp and Paper Industry will meet jointly with the Miami Valley Division of the American Pulp and Paper Mill Superintendents Saturday, February 4, 1939. This will be a dinner meeting at the Anthony Wayne Hotel in Hamilton, Ohio.

J. R. Simpson, Champion Paper and Fibre Company, who has recently returned from a visit to England and Scotland, will speak. His talk "Papermaking in England and Scotland" will be based largely on personal observation and should give a very interesting picture of modern papermaking in those countries.

Buy Chatham Paper Co.

SAVANNAH, Ga., January 16, 1939.—Alexander R. Lawton, 3rd, and Richard Heard have bought the Chatham Paper Company from J. F. Curran.

Under the new ownership the Chatham Paper Company, located at 202-204 West Bay, will be incorporated. The company will be distributors for the Union Bag and Paper Corporation. It will carry a full line of heavy paper and bags, and paper specialties.

All the present employees of the Chatham Paper Company will continue in its service under the new management.

Paper and Twine Club to Dine

Plans have been completed for the third annual eastern banquet of the Paper and Twine Club to be held in the Grand Ball Room of the Waldorf-Astoria in New York on Wednesday evening, February 22. It will be the only large evening event of convention week and the committee expects that it will bring back to many memories of the famous dinners held in "the good old days" by American Paper and Pulp Association and National Paper Trade Association.

President Frank P. Vaughan of the Bay West Paper Company, Green Bay, Wis., will be the toastmaster. He will refer in his remarks to the club's proposed training course for paper selling. Lowell Thomas, nationally known commentator, and Hon. A. E. Giegengack, Public Printer of the United States, will be the guest speakers after which there will be presented a vaudeville program with Larry McMahon as master of ceremonies.

The local committee appointed by the New York Chapter of the club consists of James F. Levens, F. H. Savage, Fred Schlosser, E. P. ("Bud") Miles, R. H. Faulkner, P. C. Batzle and Charles C. Walden, Jr.

Co-operating is a committee appointed by president L. E. Sayer of the Paper Association of New York City consisting of Charles Addoms, Oswald F. Marquardt, Robert Schmidt, R. C. Kettles, Jr., and G. W. T. Skinner.

The dinner will be informal and present indications point to an attendance of about 700. Reservations may be made through any committee member or to Charles C. Walden, Jr., 41 Park Row, New York.

Sam Orton Discusses Contest

BOSTON, Mass., January 30, 1939—A sales meeting of Carter, Rice & Co., Corporation, was held at the office of the company Saturday, at which Sam Orton, sales representative of Linton Bros. & Co., Fitchburg, Mass., discussed the pieces that won awards in the Fourth Annual National Advertising Contest. Norman Harrower, president of Linton Bros. & Co., spoke. The Fifth Contest of Linton Bros. & Co., for advertising printing on Bristols closes December 1, 1939. The prizes include $100, $75, and $50 for first, second and third places, respectively and 40 awards at $15 each.

Announce New Envelope Paper

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 30, 1939—The Parker-Young Company, whose mill is at Lincoln, N. H., has just announced a new blue-white envelope paper, to ge known as Montwhite Pemi, which answers a demand for an ultra blue-white envelope sheet. With the addition of this new shade, the Parker-Young Company now has three distinct shades of white wove envelope paper. The two others are Plymouth, a cream-white, and Lincoln Pemi, an intermediate shade, which has been standard for some years.

To Be Sales Manager of Packing Dept.

Frank J. Hill, for some years Eastern sales representative of Greene, Tweed & Co., manufacturers of "Palmetto" and other brands of mechanical packing, has been made sales manager of the domestic division of the corporation's packing department.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

New Haven, Conn.—The New Haven Pulp and Board Company, East street, manufacturer of paper board products, chip board, etc., has awarded contract to the Dwight Building Company, 67 Church street, for alterations and improvements in mill. Work will be placed under way at once. No estimate of cost has been announced.

St. Louis, Mo.—The Gaylord Container Corporation, 2820 South Eleventh street, manufacturer of corrugated boxes and containers, folding paper cartons, etc., has arranged for construction of new one-story building in connection with lease of property at Second and Dorcas streets, consisting of five existing industrial structures, owned by Anheuser-Busch, Inc., as recently noted in these columns. New structure will be about 275 x 300 feet, and will be erected by the L. O. Stocker Company, Arcade Building, St. Louis, which has contract for modernization of present building. Company will use entire property, totaling in excess of 100,000 square feet of floor space, for its folding carton division, and will carry out large increase in capacity. Entire project is reported to cost over $115,000, including equipment.

Neenah, Wis.—The Bergstrom Paper Company, has awarded contract to the Fluor Brothers Construction Company, 48 Otter street, Oshkosh, Wis., for mason work in connection with new water purification plant to be erected at mill on West Wisconsin avenue. An award for clarifier has been placed with the Dorr Company, New York, N. Y. Work on plant is scheduled to begin at early date. Orbison & Orbison, 206 West College avenue, Appleton, Wis., are consulting engineers.

Brooklyn, N. Y.—The Cello Fibre Can Company, 126 21st street, manufacturer of fiber cans and containers, has arranged for lease of space in local industrial building at 125 Twenty-sixth street, and will occupy at early date. Company is said to be arranging for expansion in output at new location.

Detroit, Mich.—The Hinde & Dauch Paper Company, Decatur street, Sandusky, Ohio, manufacturer of corrugated boxes and containers, has begun construction of new branch plant at Detroit, where tract of about 11 acres of land was acquired recently at West Chicago boulevard and line of Pennsylvania Railroad, as previously reported in these columns. Superstructure for main one-story mill, 200 x 510 feet, will be under way soon, to be supplemented with a number of smaller buildings. New plant is scheduled to be ready for service in April and is estimated to cost approximately $500,000, with equipment. Otto Randolph, Inc., 53 West Jackson boulevard, Chicago, Ill., is general contractor.

Cincinnati, Ohio—The Formica Insulation Company, 4620 Spring Grove avenue, manufacturer of sheet insulation products, has awarded a contract to the B. & J. Jacobs Company, 1729 John street, local representative for the York Ice Machinery Corporation, York, Pa., for installation of a new heating, humidifying and air-conditioning system for plant and offices. Work is being placed under way. A 10-ton refrigeration system will be installed to handle the required capacity. Fosdick & Hilmer, Union Trust Building, are consulting engineers.

New York, N. Y.—Arch-Bilt Corrugated Products Corporation, 53 33rd street, Brooklyn, manufacturer of corrugated paper boxes and containers, has leased space in building at 100 Fifth avenue, New York, and will occupy for metropolitan headquarters.

Newton, Mass.—The G. & S. Paper Company, 93 West street, general paper products, is arranging for early award of building contract for new structure on Watertown street, for which bids were closed recently, as previously noted in these columns. Superstructure will be placed in progress promptly thereafter. New building will be used for storage, distribution and company headquarters, and will be one-story and basement, 74 x 171 feet, estimated to cost close to $50,000, with equipment. Increased operating facilities will be provided. C. S. J. White, 199 Harvard circle, Newton, is architect.

Kansas City, Mo.—The Agar Manufacturing Corporation, Whippany, N. J., manufacturer of corrugated boxes and containers, has completed plans for new branch plant in the Greater Kansas City area, consisting of three main units, each one-story. These include a manufacturing building, 150 x 400 feet; a storage and distributing building of same size, including boiler house; and an office unit, 40 x 102 feet. New plant is reported to cost in excess of $100,000, including equipment. Bids have been asked on general erection contract and award is scheduled to be made at early date.

Chattanooga, Tenn.—The Atlas Paper Box Company, 1301 Cemetery avenue, manufacturer of paper boxes and containers, has work under way on new one-story addition to plant, to be used primarily for storage and distribution service. New unit will be pushed to early completion. It is reported to cost close to $40,000, with equipment.

Los Angeles, Cal.—The Pioneer Division of Flintkote Company, 5500 South Alameda street, Vernon district, manufacturer of coated board stocks, liner boards, roofing papers and kindred paper products, has work in progress on new addition to mill on

East Fifty-fifth street, for which general contract was awarded recently to the Austin Company of California, Inc., 777 East Washington boulevard, Los Angeles, as previously reported in these columns. It is proposed to have the structure ready for occupancy in near future, to be used for increased production facilities, storage and distribution. It will be one-story, 270 x 350 feet, and will represent an investment of close to $175,000, including equipment.

St. John, N. B.—The Canadian Bag Company, Ltd., 2485 St. Patrick street, Montreal, Que., manufacturer of paper bags, containers, etc., has concluded arrangements for purchase of the former Ford industrial plant on Clarence street, St. John, and will remodel and improve for new mill, with installation of equipment for sizable capacity. Work is scheduled to be placed under way at early date. Estimated cost close to $50,000, including equipment.

Philadelphia, Pa.—Fire recently damaged the three-story building of Hancock Paper Company, 12th and Noble streets, used for storage and distribution of waste paper goods. Loss is reported in excess of $20,000. Plans are under way for rebuilding.

Boston, Mass.—The Enterprise Wallpaper Manufacturing Company, 191-205 A street, has leased additional space in building at location noted, and will occupy for expansion. Property will be taken over at once and increased facilities provided.

New Companies, Etc.

Allenwood, N. J.—Wilsonite Products, Inc., has been incorporated with a capital of $100,000, to manufacture wood pulp products, including board specialties, etc. It is proposed to operate a mill in this vicinity. Frederic W. Wilson, Allenwood, is principal incorporator and company head.

Springfield, Mass.—The Crescent Paper Corporation, 31 Elm street, has been incorporated with capital of 100 shares of stock, no par value, to deal in paper products of various kinds. Harold W. Hixon is president and Wilbur H. Smith, treasurer.

New York, N. Y.—The equipment at the plant of the Able Paper Box Manufacturing Company, Inc., 193 Mercer street, has been sold at public auction to a number of purchasers, under a chattel mortgage foreclosure sale.

Jersey City, N. J.—The Atlantic Paper Box Corporation has been chartered with capital of 1000 shares of stock, no par value, to manumacture and deal in paper boxes of various kinds. It is proposed to operate a local plant. New company is represented by Emanuel Sacks, 257 Central avenue, Jersey City, attorney.

New York, N. Y.—The 146th Street Paper Stock Corporation has been incorporated with capital of 100 shares of stock, no par value, to deal in waste paper stocks, with warehouse and headquarters on 146th street, Bronx. New company is represented by Hannibal Milano, 300 East 116th street, New York, attorney.

Los Angeles, Cal.—The Federal Paper Company, 440 Seton avenue, has filed notice of company organization to deal in paper products of various kinds. Raymond G. Clapp, 528 West California street, Glendale, Cal., and Edwin L. Simon, 4848 Lexington avenue, Los Angeles, are heads.

Goes With Montmorency Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

GREAT BEND, N. Y., January 30, 1939—Announcement is made that J. Victor Baron, formerly vice president and general manager of the defunct Sherman Paper Company has accepted a position as supervisor of a division of the sales department of the Montmorency Paper Co., Ltd., of New York City. His new position will require him to travel west as far as Chicago and east as far as Boston, visiting several of the large publishing centers. The corporation markets newsprint for the Anglo-Canadian Mills, Ltd., of Quebec, which is controlled by the noted British publisher, Lord Rothmere. Mr. Baron has had a wide experience manufacturing and marketing paper, having been connected with the St. Regis and Taggart concerns for about 33 years. He started his career in the office of Campbell & Bermingham in the old St. Lawrence mill at Dexter in 1857. On July 1, 1900, he went with the St. Regis Paper Co., then controlled by the late George C. Sherman and the late David Anderson. Mr. Sherman disposed of his interest in the company and took over the Taggart Paper Company, which after his death became the Sherman Paper Company, he made Mr. Baron vice president and general manager which position he retained until the concern suspended operations last fall. Mr. Baron will continue to maintain his residence in Watertown although he expects to be traveling a greater part of the time in his new position.

Red Pitcher Rounds Out Fifty Years

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 30, 1939—Redington Pitcher (popularly called "Red") will round out fifty years of faithful service with John Carter & Co., Inc., in February. In 1889, Mr. Pitcher came from Waldoboro, Me., joining the card department force of the company, then under the management of the late Lester P. Winchenbaugh, who established his own business in 1898. After a few years Mr. Pitcher became chief assistant to the late Frank B. Hoffses, who died in January, 1934. Since then, Mr. Pitcher has been closely associated with the present manager of the card department, E. J. Wiseman.

An authority on cardboard, Mr. Pitcher by his quiet, efficient, unassuming manner has made a friend of every customer he has served, many of whom will welcome the opportunity to congratulate him and the company.

American Writing Changes

HOLYOKE, January 30, 1939.—Changes in the personnel of the American Writing Paper Corporation, were announced this week by Peter Freedman, comptroller.

R. D. W. Ewing, vice-president, has been assigned to new duties in the administration department as assistant to the chairman of the board of directors.

This change made necessary a re-assignment of the sales force. J. H. Sweet has been appointed field sales manager, directing sales efforts in the paper merchant trade. F. A. Curtis has been appointed field sales manager directing sales efforts in industrial, technical and converting papers. W. J. LaCrosse is being moved from Chicago to take over the position as sales office manager. The direction of sales and advertising department is in charge of R. S. Madden, as before.

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COMING EVENTS IN PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixty-second Annual Convention and meeting, Waldorf-Astoria Hotel, New York. February 20-24.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Roosevelt Hotel, February 20-23.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 21.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel. New York. February 20-22.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

HIGH TAXES A MENACE

As appropriations of the Federal Government increase to steadily force the national debt higher, the necessity of more taxes to meet the deficiency becomes more urgent. Expenditures for governmental activities now take approximately twenty-five cents of the dollar and that is too high in the opinion of many leading economists. Waste of public funds in the administration of government can only be controlled through a sound fiscal policy which is practical rather than theoretical. Until an attempt is made to limit appropriations and close the ever widening gap between expenditures and income, it is difficult for a business man to view commitments with much confidence. In 1929 the national income amounted to $81,128,000,000, and the percentage of taxes to national income was 12.0 per cent, while the per capita tax (Federal, State and local) totaled $96.35. In 1937 the per capita tax has been estimated at $130.75 and the percentage of taxes of national income had risen to 17.6 per cent.

The vote of the Senate to uphold Congress and cut $150,000,000 from the relief appropriation asked by the President, is an encouraging step in the right direction. No one, of course, objects to adequate aid to needy citizens, but the present relief system is clearly in need of revision to reduce the increasingly heavy burden which employer and employee now are required to bear. High taxes is one of the most important factors in the current business situation and is retarding a general business recovery. While adverse factors other than taxes exert a retarding effect on business recovery, such as strikes and disturbing labor decisions, high taxes continue to act as a brake on industrial expansion and the attainment of a higher level of prosperity. As the proportion of business profits required to pay taxes is increasing from year to year, it withdraws capital from productive use to pay for unproductive governmental use. Essential government functions are, of course, vital, but the point is to stop wasteful and unessential expenses by following a sound fiscal policy.

In attempting to call the attention of the public to the menace of high taxes, president George H. Davis of the Chamber of Commerce of the United States has begun the posting of some 25,000 outdoor posters carrying the title, "What Helps Business Helps You —Less Taxes and More Jobs." In announcing this display Mr. Davis said: "People all over the country are realizing that business is not something to be restricted and abused. They are recognizing that both big and little business is what has made America the outstanding nation of the world. They are worrying over continued deficits and know that if they are not stopped soon, they will become so huge as to be unmanageable, with the final outcome either inflation or repudiation.

"Capital, labor and management are all ready to go. Reducing taxes is the surest way to restore confidence, making it possible for business to expand and employ the idle. Our hope is that the message on these 25,000 billboards, set up all over the United States, will inspire people to encourage their Senators and Congressmen to tackle the unpopular, almost impossible, job of economizing by reducing the cost of government."

How greatly taxes have absorbed business profits may be indicated in one example. Twelve steel producing companies with total assets in 1937 of $4,182,000,000, and with sales of approximately $2,950,000,000, showed net, after all charges, of $199,000,000, after paying or providing for $149,000,000 in taxes. This works out to 75 cents in taxes for each dollar of net income and to 42.8 cents in taxes for each dollar of net income before taxes. Many other instances could be given of business enterprises paying taxes in excess of 40 per cent of their net incomes.

In championing the cause of economy Senator Harry F. Byrd, Democrat from Virginia, disagreed

with the Administration's policy defended by Marriner S. Eccles, chairman of the Federal Reserve System who advocated continued Federal spending for recovery. Senator Byrd said in part: "It was my pleasure to attend the Jackson Day banquet a few night ago. I witnessed the seance and heard the short wave conservation between Andrew Jackson and the present President. I though I overheard Old Hickory say that in 1836 he paid off the public debt in toto. I know that in a letter dated July 4, 1824, Jackson said: 'If a national debt is considered a national blessing then we, like Great Britain, can get on by borrowing. But as I believe it a national curse, my vow shall be to pay the national debt, to prevent any moneyed artistocracy from growing up around our administration that must bend it to its views, and ultimately destroy the liberty of our country' . . . Mr. Roosevelt was right when he said that taxes are paid in the 'sweat of every man who labors'. High taxes mean high cost of living. High taxes retard business expansion and prevent the employment of the unemployed.

"To the suggestion that this public debt need not be paid, I respond that America has always paid her debts. If the Government does not pay in an orderly way its debt, the citizen will not pay his debt and financial chaos will follow. The payment of 500 millions each year, as applied to the direct debt only, will take 56 continuous years to pay it down to where it was when the deficit spending began."

Unity Paper Files Bankruptcy Petition

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., January 20, 1939—The Unity Paper Corporation has filed a bankruptcy petition in federal court showing liabilities of $169,908 and assets of $25,000. The petition was signed by Bernard Wade, treasurer, and filed through Attorney Cubley, of this place. The Citizens National Bank claims $6,500 and the People's Bank $5,000, both being prior claims. D. F. Burke is trustee for $25,000 in mortgage bonds issued in 1922 while another issue of 1931 is for $100,000. Other creditors include the Papermakers Chemical Corporation, Carthage Coal Company and the St. Lawrence County Utilities. The other 30 creditors are scattered. The company, for many years makers of high grade book and ledger papers, went into receivership in 1929, not long after a $200,000 bond issue was floated. In 1935 the firm was granted permission to reorganize and to issue certificates of $20,000 with which to operate.

Donald R. Taber to be General Manager

HOLYOKE, January 30, 1939.—Donald R. Taber of 86 Allyn street, has been named to the newly created position of general manager of the American Pad and Paper company. He has also been named to the Board of directors of the company. Mr. Taber who was formerly with Esterbrook & Company, investment bankers, became associated with the local company about 10 years ago.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1939	1938(c)	1937(c)	1936	1935	1934
January	.....	63.9%	90.3%	76.1%	65.8%	.....
February	.....	68.7%	90.1%	77.9%	70.0%	.....
March	.....	69.6%	90.3%	76.0%	70.5%	.....
April	.....	68.3%	92.1%	82.3%	70.0%	.....
May	.....	69.0%	90.6%	81.6%	69.4%	.....
June	.....	66.0%	87.3%	80.7%	72.3%	.....
July	.....	72.0%	81.8%	77.3%	64.9%	.....
August	.....	77.2%	82.9%	81.5%	70.9%	.....
September	.....	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.5%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	72.3%	80.6%	81.3%	70.5%	.....
First 3 weeks	76.5%	62.5%	90.4%	75.5%	64.1%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS		CORRESPONDING WEEKS	
*December 17, 1938	80.8%	December 18, 1937	60.0%
*December 24, 1938	76.7%	December 25, 1937	48.6%
*December 31, 1938	62.9%	January 1, 1938	47.0%
*January 7, 1939	70.1%	January 8, 1938	59.2%
*January 14, 1939	80.8%	January 15, 1938	62.3%
*January 21, 1939	80.0%	January 22, 1938	66.0%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks					
Ratio Limits	Dec. 17, 1938	Dec. 24, 1938	Dec. 31, 1938	Jan. 7, 1939	Jan. 14, 1939	Jan. 21, 1939
0% to 50%	64	64	115	84	55	41
51% to 100%	244	240	190	216	228	159
Total Mills Reporting	308	304	305	300	283	200

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1938 (e)	1937 (e)	1936	1935	Mos.	1938 (e)	1937 (e)	1936	1935
Jan.	55%	80%	61%	61%	July	57%	67%	69%	59%
Feb.	61%	86%	67%	67%	Aug.	66%	74%	75%	65%
Mar.	60%	87%	68%	67%	Sept.	66%	70%	76%	69%
Apr.	57%	89%	70%	61%	Oct.	70%	66%	82%	76%
May	58%	86%	68%	61%	Nov.	64%	56%	79%	70%
June	56%	75%	68%	65%	Dec.	.....	46%	74%	60%

Week end. Dec. 17, 1938—65%
Week end. Dec. 24, 1938—69%
Week end. Dec. 31, 1938—35%
Week end. Jan. 7, 1939—45%
Week end. Jan. 14, 1939—62%
Week end. Jan. 21, 1939—65%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 1, 1939—The Fitchburg Paper Company has been awarded the contract for furnishing the Government Printing Office with 100,000 pounds of manila calendered tag board in 23¼ and 26½ inch rolls, at 6.47 cents. Also Barton, Duer & Koch Paper Company will furnish 10,000 sheets of 22 x 28 gray photo mount board at $36.20 per M sheets. Bids for these items were received on January 11.

Whitaker Paper Company will furnish 1,000 sheets of 22 x 28 mist gray photo mount board at $56.70 per M sheets, bids for which were received on January 6.

R. P. Andrews Paper Company will furnish 37,650 pounds (150,000 sheets) of 39 x 51 white coated book paper at 6.14 cents, bids for which were received on January 4.

Whitaker Paper Company will furnish 81,992 pounds of 32 x 54 green sulphite writing paper at 5.43 cents.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Water-Soluble Acidity or Alkalinity of Paper

TAPPI Standard T428m-39, Revised January 1939

Scope

This method is not applicable to highly-alkaline papers such as those containing casein or calcium carbonate.

Apparatus

The special apparatus required for this test is a grinder which will completely disintegrate the paper without heating or contaminating it and a steam or oil bath which can be maintained at 100 deg. C. The grinder shall be a Koerner type or its equivalent.

The balance used for weighing shall be sensitive to 1 mg.

The glassware shall be acid- and alkali-resistant.

Reagents

(a) 0.01 *N* sodium hydroxide solution, conveniently made by diluting 100 cc. of 0.1 N NaOH to 1 liter with freshly boiled and cooled distilled water.

(b) 0.01 *N* hydrochloric or sulphuric acid.

(c) Phenolphthalein indicator solution.

Test Specimen

The specimen for test shall be cut from the test sample in such a way as to be thoroughly representative of it, and shall be completely disintegrated in the grinder.

Procedure

Allow the ground specimen to come to moisture equilibrium with the atmosphere of the balance case, and weigh at the same time 5-gram portions (to nearest 1 mg.) for the acid extractions and moisture determination. Determine the moisture content on one portion by the standard TAPPI method. Transfer another weighed portion to a 500-cc. Erlenmeyer flask and add 250 cc. of boiling water. In some cases, the fibers absorb water slowly and tend to float on the surface of the water. This is avoided by first adding small portions of the water and shaking well until the fibers are thoroughly saturated. After the water is added, affix to the flask a stopper containing a narrow glass tube about 30 inches in length, which serves as a condenser. A soil-digestion flask which has a ground-glass stopper and condensing tube in one piece, or a rubber stopper covered with metal foil, may be used. Place the flask in a heating bath which will maintain the contents of the flask at 98 to 100 deg. C. Heat at this temperature for one hour with occasional shaking. At the end of this period pour the contents of the flask on a Büchner funnel (without other filtering medium) and wash the fibers remaining in the flask into the Büchner funnel with 10 cc. of water. Apply strong suction to the fibers, then cool the extract rapidly and titrate it as soon as it reaches room temperature. Add phenolphthalein indicator and if the extract remains colorless, determine the acidity by titrating with 0.01 *N* NaOH until the first appearance of a permanent pink coloration. If on addition of phenolphthalein, the extract has a pink color, determine the alkalinity by titrating with 0.01 *N* HCl or H_2SO_4 until the color is just discharged. Make a blank titration on 250 cc. of the water heated for 1 hour in the same bath and with the same glassware used for the extractions.

Each test result used in calculating the acidity or alkalinity shall be the average of not less than two determinations. The percentage results of duplicate determinations shall agree within 0.01.

Report

Total acidity or alkalinity shall be expressed as a percentage of the moisture-free paper in terms, respectively, of sulphuric anhydride, SO_3, or in terms of sodium oxide, Na_2O, to the nearest 0.01. They are calculated as follows:

Let T_1 = cc. NaOH required to neutralize extract;
T_2 = cc. acid required to neutralize extract;
t = the cc. of NaOH required to neutralize the blank;
N_1 = normality of NaOH solution;
N_2 = normality of acid solution;
and W = weight of test specimen less moisture.

Then (1) per cent $SO_3 = \dfrac{(T_1 - t) \times N_1 \times 0.04 \times 100}{W}$,

or (2) per cent $Na_2O = \dfrac{(T_2 \times N_2 + t \times N_1) \times 0.03 \times 100}{W}$.

Additional Information

This method is based on the method for acidity described by S. Kohler and G. Hall in *The Paper Industry*, 7, No. 7; (Oct. 1925), with some modifications developed at the National Bureau of Standards. In this revised method, one extraction is specified instead of the three extractions originally specified, because Kohler subsequently found that one extraction is sufficient for classification of paper. See "Investigation into the Determination of Acidity and Copper Number in Paper, Statens Provingsanstalt," Stockholm, Meddelande 56, 1932. In this article, it is stated that the acid number thus obtained is about ¾ of that obtained by three extractions.

Studies of this method and other acidity methods are reported by Wehmhoff and by Wehmer in Technical Association Papers (TAPPI), May, 1930 and May, 1931.

The Koerner type of grinder is described in National Bureau of Standards Research Paper RP295.

Puncture Testing of Box Board*

By R. L. Beach[1]

Abstract

This paper describes a new apparatus for testing of corrugated board and other boxboard by means of a pyramid-shaped metal puncturing point.

By means of this apparatus it is claimed that many of the mechanical variations occurring in existing apparatus of this nature have been eleminated, and in addition the results are comparable even though the materials are of different structure.

Some results are given on tests made by this method in comparison with tests made by existing apparatus.

It is generally recognized that the quality of a corrugated box is dependent on three factors: First, puncture and tear resistance of the material itself; second, rigidity of the material itself; and third, rigidity of the setup box.

It is not the intention at this time to discuss the relative importance of these three factors, particularly in view of the fact that the requirements for a box for a specific commodity are usually quite different from those for some other commodity so that over-emphasis may be placed on any one of the above factors in the designing of a box for a particular purpose. These factors affecting quality apply equally as well in the case of solid fiber, cleated fiber, plywood, etc. This article is concerned wholly with a description of a new method of measuring the puncture resistance of boxboard and the results obtained from testing samples of various boxboards.

Since the beginning of the use of corrugated boxes, the necessity of a standard for resistance to puncture has been recognized, and this is the only measure of quality of a corrugated box at the present time recognized by the Freight Classification Committee. There has been a standard machine used for many years for measuring the bursting resistance of boxboard, and while many laboratories have made other tests on setup corrugated boxes to determine the comparative quality, such tests have not as yet been considered as a standard requirement.

An accurate method of measuring the resistance to puncture appears to be desirable for the following reasons. This requirement is the major requirement of the Freight Classification officials. The increased use of corrugated board having a very high puncture resistance makes this test more important. With Kraft boards, a tearing factor has to be taken into consideration in addition to merely their bursting resistance in order to determine the real value.

Observation of boxes after shipment has indicated that the few containers that are found to be in poor condition show failure because of the three following causes: First, breaking along the score line adjacent to the flaps; second, puncture; and third, crushing from heavy top loads.

These defects agree with those found on the experimental shipments made by the Southern Kraft Corporation in its work in connection with the material presented to the Interstate Commerce Commission on the so-called 0.014 liner case. Their shipments were principally of canned goods, but some of their results at least would have been obtained irrespective of the commodity being shipped. Out of 5,302 boxes shipped, 51 per cent were found to have top or bottom scores ruptured, 26 per cent were punctured clear through, and 15 per cent showed severe crushing due to top load. These percentages do not necessarily mean that the contents were damaged, but that this was the condition of the shipping containers. This agrees fairly well with our own observations, keeping in mind that a single box may show more than one of these kinds of damage and that the external signs of damage do not necessarily mean damage to the contents.

From this it would appear that the puncture resistance of corrugated board is an important factor, and any apparatus that will mesure the average tearing resistance of corrugated board may give some measure of the resistance to tear at the score lines.

The Problem

A single sheet of paper or paperboard is not a uniform structure. This is easily seen in the case of thin paper by holding it to the light. Paperboard as heavy as 0.016 if first dipped in kerosene, can be examined when held over a very strong light. Examination shows light spots and dense spots, some light spots being almost transparent. On some varieties of board, actual holes, usually smaller than pinholes, will be seen.

Of course visual examination cannot disclose the non-uniformity of heavier board, such as 0.100-inch solid fiber, or combinations of board, such as corrugated board or plywood. It is obvious, however, that the non-uniformity which exists in a material which can be examined by transmitted light exists even to a greater extent in thicker material.

A difference in thickness of at least 10 per cent, plus or minus, is expected even on comparatively good grades of paperboard. This variation is found with a micrometer having a foot or anvil of ⅛-inch diameter, an area which cannot detect the valleys of smaller areas.

The significant point is that these variations in thickness are, of course, accompanied by corresponding variations in strength of particular portions, of the material.

Theory and Description of Apparatus

Any instrument used for measuring the strength of shipping-container materials should give an average measure of the strength of the material over a considerable area. It should not be affected by the minor inequalities of the material which would not affect the value of the material for use as a shipping container. This should be a true average and not a measure of the weakest point. In a laboratory measurement of the quality of many materials, the weakest point of failure is of prime importance, but in the case of shipping containers this is not so. Obviously, the material from which a box is made, whether of fiberboard, corrugated board, or plywood, could be

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punctured by innumerable small holes without effect on its quality as a general-purpose box. On the other hand, the measure of the strength of box board must not be a measure of its maximum or the container will fail because of the low average strength of its weakest part or direction.

It is quite possible to obtain the average strength of a comparatively thin single piece of material by measuring its resistance to tear, rupture and stiffness in several directions, and averaging the results. This is not possible, however, in the case af heavy materials and materials built up of several component parts. Here the failure is governed by the strength of the individual parts rather than the built-up combined material.

With these principles in mind efforts were made to develop a testing device which would:

First, rupture a considerable amount of material to avoid small variations.
Second, rupture all components of combined materials equally and as far as possible simultaneously.
Third, rupture along defined lines so that the rupture would be independent of such factors as grain direction and direction of corrugations.
Fourth, rupture in a sufficient number of different directions so that the results would be an average strength in all directions.
Fifth, itself have relatively few inherent variations because of friction, gauges and springs.
Sixth, be calibrated in definite units of energy, and which could be duplicated and checked without elaborate apparatus or difficulty.

The apparatus finally developed, shown in Fig. 3, involves use of a pendulum, on the end of which is fixed a rod bent in the form of an arc of 90 degrees. To the end of the rod is affixed a metal point having the shape of a triangular pyramid, one inch in height.

The pendulum principle has been used in many varieties of testing apparatus, such as the Elmendorf and Charpy testers. As a testing instrument it has the following advantages: First, the potential energy can easily be calculated by knowing the weight and center of gravity of the pendulum; second, the energy used in performing a certain amount of work is also easily calculated by subtracting the energy remaining after the work is performed from the initial energy; third, friction can be easily compensated for by providing a movable stop for the pointer so that the reading is always zero when no work is performed (that is, when the pendulum is allowed to swing freely); fourth, the apparatus is very simple; fifth, one size of tester, when additional weights are provided, can be built to accommodate a great range of materials.

In the apparatus as it has been developed, the corrugated board or similar material is held between two clamping plates which are approximately at the level of the axis of the pendulum. The upper plate is fixed and the lower plate is held by spring pressure against the material. Since the lower plate merely serves as a holding plate, heavy springs are not required; consequently there is no crushing of the corrugated sheet or slippage of material.

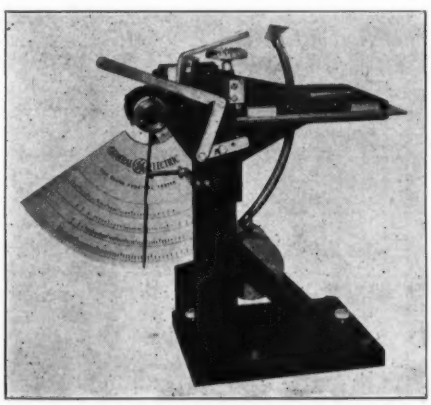

FIG. 3.

The pendulum is held up by a trigger and stop in a horizontal position. If there is no material between the clamping plates, and the trigger is released the pendulum will swing through an arc of 180 degrees to the horizontal position, except for a small retardation due to friction. This friction is compensated for by an adjustable stop against the pointer, so that the pointer comes to the zero mark with a free swing.

If material is between the clamping plates some of the energy of the swing will be used up by the puncturing point punching through the material, and consequently the pendulum will not swing as far as 180 degrees by the amount of the energy that has been used. The pointer remains at its maximum reading position by a simple friction bearing.

There are no variables in the apparatus except the friction of the bearings and the pointer sleeve. With the use of high grade ball bearings it has been found that this friction is constant, and very small. The apparatus can be checked at any time by allowing the pendulum to swing free and adjusting the zero reading if necessary. It has been found that it is seldom necessary to do this.

In the model described, the bare pendulum weighs 9 lb. and the center of gravity was 5.43 in. from its axis, so that its potential energy when in the horizontal position was 48.87 in.-lb. Additional lead weights were provided to give total potential energies of approximately 87.9, 183.25 and v57.5 in.-lb. corresponding scales being worked out for each combination of weights. It was found in practice that this apparatus will test all materials ranging from 0.016 liner board to combined solid fiber or corrugated board of the heaviest grades manufactured, and plywood up to a thickness of at least 3/20 inch.

The different scales provided for the different weight combinations were checked mathematically as well as by actual tests. In general practice, weights and corresponding scale are used which would give readings in the middle portion of the scale, not working to the extreme ends.

The scales were calibrated according to the formula developed by Carson and Snyder of the Bureau of Standards *(1)*. This formula, which has been checked by other authorities, is:

$$Wg\ (1 - \cos A) = Wg\ (1 - \cos A') + R$$

Wg equals the inch-pounds of potential energy at the height or angle of start of the swing; A equals the angle at the start of the swing, which is 90 degrees; A′ equals the angle at the finish of the swing; and R equals the energy in pounds used in penetrating the material.

The scale reading is the actual inch-pounds of energy used to puncture the material with the pyramid-shaped point on the end of the rod.

For the bare pendulum the velocity of the puncture point at the time it passes through the material is 82.7 inches per sec. In order that the apparatus give comparable results when used with different weights, it is only necessary to keep the velocity of the puncturing point practically uniform, other factors being constant. The mathematical principles involved, and their application in this particular apparatus, have been

worked out in detail by E. H. Hull of the Research Laboratory of the General Electric Co. This explanation is attached as an appendix to this report.

It seemed logical to calibrate the scales in inch-pounds. The numerical values resulting, however, for the ordinary grades of boxboards are not as high as might be desirable, tending to give a false impression of the quality of the material. It is possible that inch-ounces, which would multiply the numerical values by 16, would be a more desirable scale.

The actual work done is the making of three tears, each 1⅝ inches in length, caused when the pyramid forces its way through the material. In addition, the three triangular-shaped pieces of board formed by these tears are bent up, allowing the point to pass through the material. Thus much of the energy of the pendulum is used in bending the material, so that it is also a measure to a certain degree, of the stiffness of the material.

By cutting a "Y" in the material before making the test, with each leg of the "Y" slightly longer than the tear which will be made by the point in its usual rupture, the stiffness of the material alone can be measured. Consequently, by making tests on the same material in both ways, stiffness and tearing resistance can be measured.

Studies of this stiffness factor for different materials have not yet been completed. The indications are that for corrugated board (single wall) the percentage of the total puncture resistance as measured, 40 to 60 is the measure of the stiffness, depending on the kind of corrugated sheet, shape of the corrugations, etc. The tests indicate that the apparatus will prove to be a quite reliable instrument for studying the effect of different corrugating mediums, shapes of corrugations, improper adjustment of corrugating equipment, etc.

The triangular pyramid form of point was chosen after experimentation for the reason that this form would seem to give an average test of the material, regardless of how it was oriented with respect to the point, grain direction, or direction of corrugations.

The chief reason for choosing this shape point, however, was that it duplicates the corner of a box, the angle formed by the edges being 90 degrees. It is probable that the great majority of punctures found in corrugated boxes after shipment, have been made by the corners of wooden boxes or crates being forcibly jammed against the corrugated boxes during transportation. So it would seem logical that a strength testing apparatus should duplicate this condition as closely as possible.

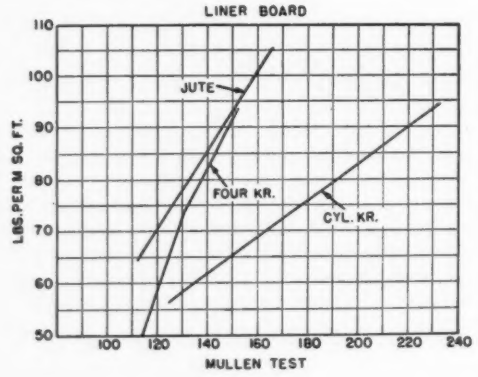

FIG. 5.

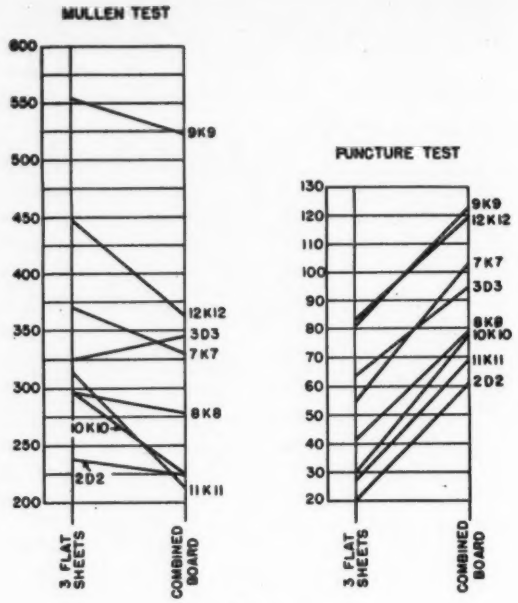

FIG. 4.

The height of the pyramid was made one inch for the reason that the Consolidated Freight Classification in the packing specifications of a few items, requires that articles enclosed in fiberboard boxes be supported or suspended so that the article will be one inch away from the inner wall of the box. This would imply that it is presumed that objects making small punctures in corrugated boxes during transportation, and not penetrating the box more than an inch will not damage the article itself.

The point and edges of the puncturing point are rounded to eliminate any cutting effect.

Results of Tests

Tests have been made on combined corrugated board, and on the three component parts taken from the same roll, all conditioned at 65 per cent relative humidity before testing. The results of these tests are shown in Fig. 4. These results indicate that the puncture tester shows a uniformly higher measure of strength for combined corrugated board than it does for the three flat sheets tested together. This is not the case with the mullen tester which has been the standard for testing corrugated board.

Tests have also been made on single sheets of board of various materials. Results of these tests, shown in Figs. 5 and 6 indicate that the puncture test of a

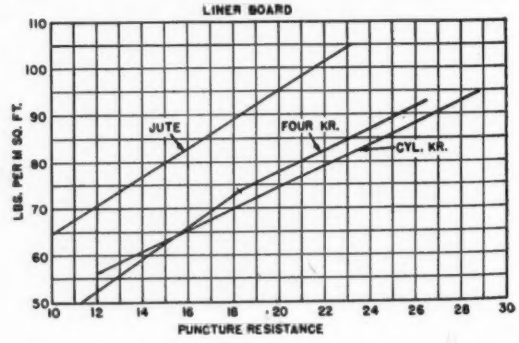

FIG. 6.

flat sheet having like fibers bears a close relation to its weight per thousand square feet. This is also true with the mullen tester. However, if the fiber formation is different; that is, if some of the boards are made on fourdrinier machines and some on cylinder, the relation ceases to exist. The puncture test still shows a relation between the weight per thousand square feet and the test results for both fourdrinier and cylinder board if the finish is pure kraft pulp. The puncture method gives a considerably lower test on a jute or filled kraft board in comparison with the weight.

The mullen tester, as is well known, gives a very much higher proportional test to a cylinder-formed sheet than it does to the fourdrinier-formed sheet, even though the weight per thousand square feet and the furnish be identical. The reason for this has been thoroughly studied and explained by many authorities. The individual fibers of the cylinder sheet lie in a straight line with the machine direction to a very considerable extent. When a piece of linerboard is tested on the mullen tester, the rubber diaphragm pushes the material up into a hemispherical shape. The board can stretch to a very considerable extent across the grain of the fibers. Probably the fibers are actually slightly separated. With the grain, however, the fibers can stretch but little. Consequently, the fibers break, invariably across the grain. Actually the mullen test is a test of the rupturing resistance of the strong direction of the material and is little affected by the strength in the weak direction. Consequently, it is far from being a measure of the average rupturing resistance.

In a fourdrinier-formed board the percentage of the number of fibers lying along the machine direction is very much less. Examination under a strong glass shows the fibers to be matted together and twisted in all directions. Consequently the number of individual fibers which must be broken to rupture the board on the mullen tester is very much less for a fourdrinier-formed board than it is with a cylinder. Thus the resulting mullen test is lower.

In comparison with the weight per thousand square feet, it will be noted that the puncture test gives an appreciably lower value to jute and filled cylinder than does the mullen test. This indicates that the real value of these boards consists largely in the percentage of new sulphate pulp rather than in the filling material, which is heavier in weight and proportionally shorter in fibers.

Tests to date indicate little if any consistent difference in the results according to the direction of corrugations or liner grain with respect to the puncturing point. All of the results given in the report are based on half of the tests being made with the material in one direction, and the other half with the material turned at an angle of 90 degrees. All mullen tests were made with half of the readings from one side, and half from the other.

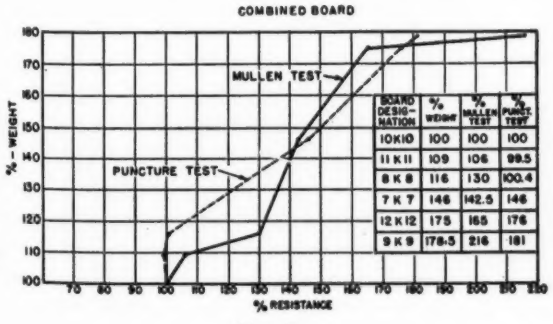
COMBINED BOARD
MULLEN TEST
PUNCTURE TEST
% - WEIGHT
% RESISTANCE
BOARD DESIGNATION | % WEIGHT | % MULLEN TEST | % PUNCT. TEST
10K10 | 100 | 100 | 100
11K11 | 109 | 106 | 99.5
8K8 | 116 | 130 | 100.4
7K7 | 146 | 142.5 | 146
12K12 | 175 | 165 | 176
9K9 | 178.5 | 216 | 181

FIG. 7.

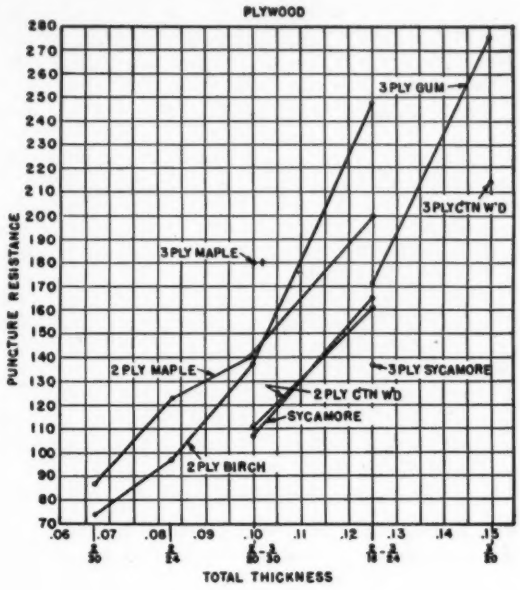

FIG. 8.

The mullen and puncture test results on combined corrugated board with jute, fourdrinier and cylinder kraft liners, are given in Table 1. The comparative results of the boards with kraft liners and kraft corrugated sheet starred in the table are shown in Fig. 7.

In this graph the weight, mullen test and puncture test values at the 10 K 10 material are all taken as 100 per cent, and the values of the other materials shown in relation to the 10 K 10.

The weight per m. sq. ft. shown is the actual total weight of the combined board, after conditioning not less than 24 hours at 65 per cent r. h.

Tests have been made on the score lines of corrugated boxes. The puncture point was centered directly on the middle of the score, and one leg of the triangular pyramid lined up with the score line, so that the tear was made on the score. The results of these tests indicated a loss in strength of from 15 to 25 per cent as compared with the board on the panels. A complete investigation along these lines may furnish valuable data as to the best type and method of scoring.

The few tests that have been made on double wall boards indicate that the puncture test method will be a reliable indication of their strength as compared with single wall. This is particularly true in the case of the heavy board with 0.030-inch liners. The elimination of "double pops" in the tests, is in itself a major factor in contributing to the accuracy of the results.

Through the cooperation of J. D. Malcolmson, Research Engineer of the Robert Gair Company, and A. W. Luhrs, President of the Container Testing Laboratories, a large number of tests were made on various materials at the Container Testing Laboratories by engineers temporarily assigned to this work. The particular puncture tester which they used was an earlier model than the one described in this report,

having a different shape and size of puncture point, so that their results are not comparable with the results as given here. Comparatively the results they obtained agreed very closely with those of the General Electric Company. Their conclusions were as follows:

"1—The new machine appeared to evaluate the puncture resistance of materials such as paperboard in a more satisfactory manner than the present methods because the puncture tester apparently recorded the average failure of the board in both the strongest and weakest directions.

"2—The new machine appeared to more nearly indicate the real strength of combined board since the test results varied more or less proportionately with the strength of the corrugating material.

"3—The new machine eliminated 'double-pops'.

"4—The new machine recorded greater strength for the combined board over three separate component sheets when tested together, while the mullen tester recorded a lower result for the combined board."

Figure 8 shows the results of the tests which have so far been made on plywood of various woods and thicknesses. The samples were all selected and conditioned at 65 per cent r. h. The results indicate the considerably higher quality of northern hardwoods, as has been generally recognized, and also the greater strength of two-ply wood as compared with three-ply of the same total thickness, probably because of the more uniform and better glue bond between the plies.

Conclusion

Experience has indicated that two of the major causes of failures of corrugated boxes in shipment are punctures resulting from blows and failure at the score lines. The puncture tester would seem to be a reliable method of measuring the resistance of any boxboard material to puncture, not being influenced to any great extent by the fiber formation, or direction of corrugations.

Observations and tests indicate that failure at score lines is due largely to the spreading of the parallel fibers in cylinder-formed sheets in the scoring operation, and the greatly decreased tensile test of cylinder-formed sheet in the direction crosswise to the fibers as compared with the strength parallel to the fibers. Any form of testing apparatus which will measure the average strength in all directions of a board with definite grain direction would to some extent measure the score-line strength.

The capability of the puncture test apparatus as designed of testing corrugated board without any flattening or deforming of the corrugations, and the complete and simultaneous rupturing of all of the component parts of such board, are features which it has long been recognized are of prime importance in a tester, but which no previous device has accomplished.

The possibilities of this type of tester being used as a measure of stiffness of combined corrugated board, and as a measure of score line strength of boxes, opens an immense field for laboratory investigation of questions that have long been recognized as of major importance, but for the determination of which there seemed to be no adequate apparatus available.

The tests indicate that this apparatus is a satisfactory measure of the strength of plywood, which there has been no satisfactory method of measuring up to the present time.

It is obvious that much more work remains to be done with this method of testing before there is a complete knowledge of the value of results obtained with the same. The results indicate, however, that such further work is justified by the probable value of the information obtained from this method of testing.

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APPENDIX

Theory of Compound Pendulum as Used in Pendulum Type Puncture Tester[2]

In making a range of sizes of the pendulum type tear testers or in changing the capacity of one size it is desirable to make the readings taken on different materials directly comparable. This condition requires keping all variables except the pendulum energy constant. Obviously such things as the size and shape of the penetrating point, the unsupported area of the material tested, etc., should remain constant in the various sizes of machine. A less obvious factor is the velocity of the puncture point as it strikes the material.

For comparative purposes, this should remain constant also.

In order to obtain the velocity of the penetrating point of the tear tester it is necessary to review pendulum theory as found in texts such as Wood's "Textbook of Mechanics." For a simple pendulum Fig. 1 moments about the pivot point give

$$-l\,W\sin\theta = I\alpha = \frac{W}{g}\,l^2\,\alpha$$

where I = moment of inertia of pendulum about pivot, lb. in sec.^{2}

α = angular acceleration, $\frac{\text{radians}}{\text{sec.}^2}$

l = length of pendulum, in.
or distance from pivot to center of gravity

g = gravity constant $= \left(\frac{\text{in.}}{\text{sec.}^2}\right) 386$

W = weight, lb.

θ = displacement angle, radians

hence $\alpha = \frac{g \sin\theta}{l}$

Actually the swinging portion of the tear tester constitutes a compound pendulum for which the moments about the pivot point are, from Fig. 2

$$-rW\sin\theta = I\alpha = \frac{W}{g}\,k^2\,\alpha$$

where r = distance of center of gravity from pivot point, in.

I = moment of inertia of pendulum about pivot point, lb. in sec.^{2}

k = radius of gyration of pendulum about pivot point, in.

hence $\alpha = \frac{-g\,r\sin\theta}{k^2}$

By E. H. Hull, Research Laboratory, General Electric Co., Schenectady, N. Y.

Comparing the expressions for a in the two cases we see that they can be made the same by making $k^2/r = l$. The period of a simple pendulum for small angles is $t = 2\pi\sqrt{1/g}$. Therefore the compound pendulum will have the same period provided

$$l = k^2/r$$

Call k^2/r the equivalent length L of the compound pendulum.

The tangential velocity at $\theta = o$ of a simple pendulum falling from an initial position of $\theta = 90°$ is the same as the vertical velocity of a body falling through the same vertical distance or $v = \sqrt{2gl}$. Since when $l = L$ the periods of simple and compound pendulums are the same, their velocities must be identical for the same amplitudes. Therefore for a compound pendulum the maximum velocity from a 90 degree drop is given by

$$v = \sqrt{2gL}$$

In order to obtain the maximum velocity of the puncture point (V_{pp}) multiply v by the ratio R/L where R is the radius of the puncture point from the pivot or $V_{pp} = R\sqrt{2g/L}$. A more rigorous derivation of this expression is given later.

L may be determined directly by timing the period of the tear test pendulum or by separately measuring or calculating r and k.

Since the capacity of one size of tear tester is changed by adding weights to the pendulum, these weights should be added at the point where they will not change the maximum velocity of the pendulum but the energy only. This point is at a distance from the pivot point equal to the equivalent length (L) of the pendulum. This is obvious when we remember that the period of a simple pendulum is independent of its weight.

The following expression may be written for a compound pendulum:

$$-rW \sin\theta = \int \frac{dW}{g} r^2 \alpha = I\alpha = \frac{W}{g} k^2 \alpha$$

where dW is a small particle at a distance from the pivot point.

$$\alpha = -\frac{\overline{rg}}{k^2} \sin\theta$$

$$\text{since } \alpha = \frac{d\omega}{dt} = \frac{d\omega}{d\theta} \times \frac{d\theta}{dt} = \frac{\omega d\omega}{d\theta}$$

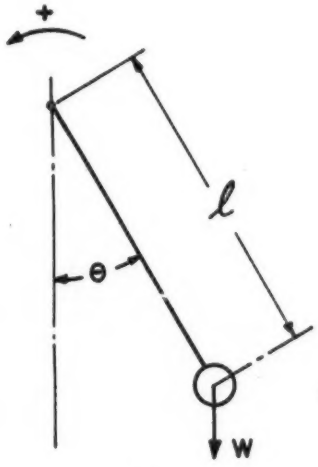

FIG. 1.

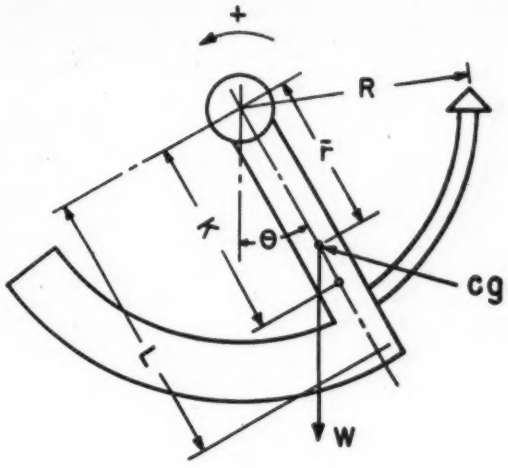

FIG. 2.

the velocity after a 90° swing from the horizontal position will be given by

$$\int_{o}^{\omega} \omega d\omega = -\int_{90°}^{0°} rg/k^2 \sin\theta \, d\theta$$

$$\omega = \sqrt{2rg/k^2}$$

$$v_{pp} = R\omega = R\sqrt{2g/L}$$

TABLE 1.—MATERIAL SYMBOLS USED BY GENERAL ELECTRIC CO.

K—.009 Corrugating Kraft
D—.009 Corrugating Straw
10—.016 Dry Finish Fourdrinier Kraft 42-lb. Basis
11—.016 Semi Water Finish Fourdrinier Kraft 47-lb. Basis
12—.030 Fourdrinier Kraft 90-lb. Basis
7—.023 Fourdrinier Kraft 70-lb. Basis
8—.016 Cylinder Kraft 54-lb. Basis
9—.030 Cylinder Kraft 95-lb. Basis
2—.016 Jute 64-lb. Basis
3—.030 Jute 120-lb. Basis

COMBINED BOARD TESTS

Material	Actual Weight	Mullen	Puncture	Weight Per Cent	M. T. Per Cent	P. T. Per Cent
10 K 10	133	246	70			
	137	233	70.5			
	136.5	236.4	76.3			
	134.6	207.5	65.8			
	135.3	230.7	70.65	100	100	100 *
11 K 10	143	236	66			
	141	226	71.7			
	139.7	244.6	78.1			
	141.2	235.5	71.90	104	102	102
2 D 2	190	217	54			
	196	224	61			
	193	220.5	57.5	143	95.5	81.5
11 D 11	164	236	58			
	164.8	323.8	64.2			
	164.4	279.9	61.1	121.5	121	86.5
11 K 11	144.1	215	69			
	146	227	66			
	141	288	71.4			
	148	234	70			
	148	292	73			
	152	238	61			
	153	222	80			
	147.4	245	70.1	109	106	99.3*
8 K 8	158.7	265	72			
	155	335	69.8			
	156.9	300	70.9	116	130	100.4*
9 K 9	240.5	522	122			
	244	500	120			
	236	469	120.3			
	240.2	497	120.8	178.5	216	181 *
9 D 9	257	398	95	189.5	172.5	134.2
12 K 12	229.7	362	120			
	233	335	121			
	233.0	410	137			
	252	414	119			
	236.9	380	124	175	165	176 *
7 K 7	198	329	103	146	142.5	146
11 D 10	152	208	63.1	112	88	89.2
8 D 8	168	276	77.8			
	164	323.8	64.2			
	166	299.9	71	122.5	126.4	100.7

Creasing and Bending of Folding Boxboards*

By J. F. Halladay[1] and R. W. K. Ulm[2]

Abstract

The interrelation of variables involved with creasing of folding boxboards is discussed. Photomicrographs and calculations based thereon are presented.

In the manufacture of folding cartons, all workmanship applied to the materials has two goals. The first is aesthetic and involves the printed decoration. The second is functional and is concerned with satisfactory protection of the contents of the box while in transit to the user. Generally, the printed decoration is applied to the sheets of boxboard before the creasing, bending and gluing of the finished box. The manner of applying the printed design therefore has little effect on the subsequent creasing operation; it is, however, possible to destroy the good appearance of the printed design by careless or ill-advised cutting press workmanship. This is frequently encountered in the form of cracked scores, etc.

This discussion aims at a clearer understanding of the variables which influence the result of creasing folding boxboards.

Various Creasing Methods

A variety of presses are used for creasing folding boxboards. All methods, however, will fall into three basic categories, namely the cylinder press, the platen press and the rolling creasing dies mounted on parallel rotating shafts. Of the three methods, by far the greatest boxboard tonnage is creased and cut on the cylinder press. Therefore, this discussion is concerned primarily with the creasing operation on that type of equipment.

The Miehle Cutter

One of the most widely used cylinder presses for cutting and creasing is the "Miehle 70 cutter and creaser." It operates on the same basic principles as a conventional Miehle flat bed printing press but the entire construction is much stronger than that used on the printing press.

The mechanism consists essentially of a sturdy flat steel bed which carries the "male" cutting and creasing die and which reciprocates in a horizontal plane beneath a heavy steel cylinder which carries the "female" die and which rotates on a horizontal axis which is perpendicular to the direction of bed movement. The cylinder is provided with accurately machined bearers at each end of its face. Suitable cam mechanism raises and lowers the journals on which the cylinder rotates so that the cylinder bearers are forced against hardened steel tracks (bed bearers) which are placed at each side of the bed. In this way accurate and coordinated rolling contact is maintained between cylinder and bed at appropriate parts of the cycle. Precise approximation of male and female dies is thus attained during the actual rolling in of the creases.

Dies and Makeready

The male die is made of plywood blocks cut to appropriate sizes and shapes determining the various details of the box wanted. These blocks are used as separators for the steel rules which do the actual cutting and creasing of the board. The rules are of two types, namely, cutting rule which is characterized by a sharp knife-like edge on one side, and creasing rule, one edge of which is gently rounded into an arc of radius approximately equal to the thickness of the rule. When all rules and blocks are cut to the desired sizes, they are fitted together to form the desired pattern and are locked with wedges into a steel chase, which in turn is clamped onto the bed of the press. The expert die maker will have seen that the tops of the cutting rules protrude beyond the tops of the creasing rules a distance which is approximately equal to the caliper of the board to be processed.

Once the male die is locked onto the bed of the press, it becomes the responsibility of the cutting pressman to cut a female die which is of proper form and dimensions to cooperate with the male die to produce a suitable cut and creased blank. In order to do this it is necessary to interpose suitable paper packing or "makeready" between the steel cylinder of the press and the curved steel jacket which fits closely around it. The average thickness of this packing is determined by the caliper of the board to be cut and creased; it is built up until the midline of the board is just at the level of the bearers. The thickness may then be changed locally to correct for minor inequalities in the male die. Thus uniform clearance between the male and female dies is insured throughout the rolling contact. Excessive impression will cause the cutting rules to be dulled quickly by direct contact with the steel jacket. Insufficient impression will result in incomplete cutting of the boxboard and, consequently, ragged edges on the blanks.

As soon as the pressman has all the cutting edges cutting properly, several plies of dense, hard manila tag board are glued to the steel jacket in an area equal to the area of the male die and coincident with its outermost margins. From this built up tag board, hereafter called the "counter," the female die is to

FIGS. 1 TO 10.

For illustrations see opposite page.

FIG. 1. Female die, paper board and male die before creasing. Top liner is toward male die.
FIG. 2. The creasing is done.
FIG. 3. The board at rest after creasing but before bending. Represents board as delivered from press.
FIG. 4. The bending begins. This and subsequent figures represent board's progress through glue machine in chronological sequence.
FIG. 5. The bending continues.
FIG. 6. The bending continues.
FIG. 7. The bending is almost complete.
FIG. 8. The 180 degree bend is complete.
FIG. 9. The score is flattened as by pressure rolls of glue machine.
FIG. 10. The board is opened out after the 180 degree bend.

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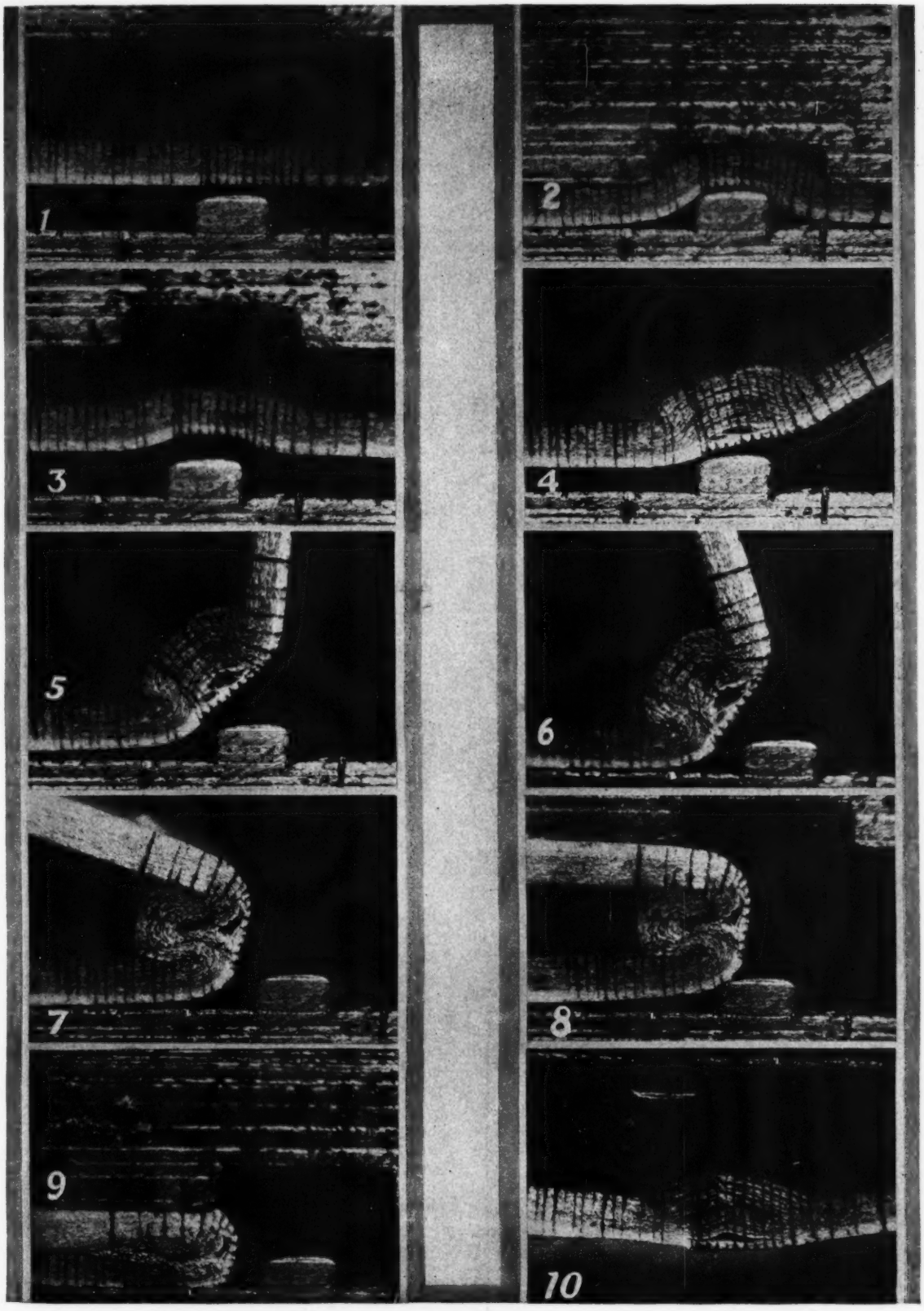


FIGS. 1 TO 10.

For descriptions of illustrations see opposite page.

be cut. The pressman then applies printing ink with a small roller or felt pad to both the cutting and the creasing rules in the male die. The press is then turned over once, printing the design of the rules onto the counter. Appropriate channels are cut into the counter along the ink lines made by the creasing rule. The widths of these channels are determined by the experience and ability of the pressman and are almost never measured. Those parts of the counter adjoining the impressions of the cutting rules are then skived down in a long bevel. This channeled and skived counter constitutes the female die. With minor mechanical adjustments, the press is ready to run.

Pressroom Cutting Troubles

Within this category there are two common troubles involved with creasing. They are (1) damage to creases during impression and (2) faulty bending of the board after creased blank is delivered from the press.

The first is the result of operating too severely upon the board during impression. It is manifest in cracked scores and/or torn panels even before the board is bent, and occurs predominantly when the box dimensions are small and the caliper of the board is relatively high.

The second trouble results from insufficient operation on the board during impression and is encountered in the form of cracked scores during the gluing operation. It occurs predominantly under the same conditions of box size and caliper.

When the grain of the boxboard runs parallel to the direction of the motion of the bed these troubles are minimized; when the grain is in the cross direction they are aggravated.

Other troubles involved with *cutting* are not within the scope of this paper.

These principles constitute the art of cylinder press creasing of boxboards. They are known to all expert cylinder pressmen. It is the purpose of this paper to determine the important variables on which these principles of the art are based and to analyze them mathematically. Subsequently the aforementioned troubles will be discussed in the light of this analysis.

Experimental

Male and female dies simulating those used on the conventional cutting press were constructed of steel. These were placed in an experimental press especially designed for this work and were used to crease samples of commercially available boxboards. Samples

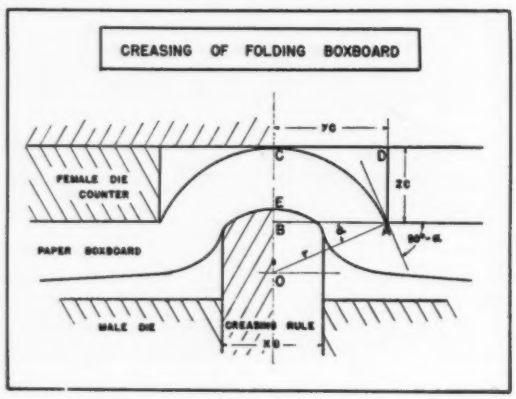


FIG. 11.

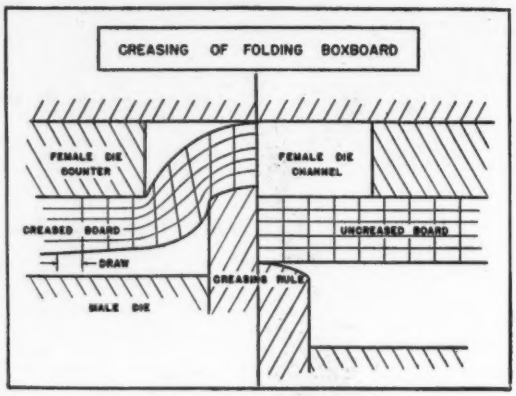


FIG. 12.

were prepared by cutting with a razor blade strips approximately one inch by six inches with the grain parallel to the long dimension. Before the strips were placed in the press, they were marked on one edge with fine parallel lines 0.006 inch apart running normal to the surfaces through the agency of a special grid made by clamping a number of razor blades together and inking the edges with printing ink. This was done to determine the relative strains within the sheet during the creasing and bending operations. The strips were then creased in the press and the results observed through a low power microscope. Photomicrographs representing a typical sample (.032 B M L C) are presented in Figs. 1 to 10.

Interpretation of Results

From Fig. 2 it appears that the back liner of the board, when pressed into the female die, takes the form of an arc, the center of which is determined by the two edges and the center of the female die channel. The top liner does not form an arc with the edge of the female (A in Fig. 11) as a center, as such would require the top liner to stretch in respect to the bottom liner. This excess draw would be concentrated in the distance between the edges of the female and in such a small distance would be a relatively high strain. The parallel lines on the board in Fig. 2 show that this excess strain does not occur. Rather, the top liner resists, and compresses the sheet over the edge of the female. In Fig. 2 this compression seems to be slightly more than 10 per cent of the caliper.

This situation is drawn in Figs. 11 and 12. From Fig. 11 the equations expressing the draw and the angle of break are developed. Figure 12 is given to show how lines drawn perpendicular to the surface of the original board would be expected to be oriented when the surfaces are in the form described above. The right hand half of this figure shows the board in the original uncreased stage, i. e. as shown in Fig. 1. The left hand half of the figure shows the board being creased as in Fig. 2. It is to be noted that these lines angle in just as do the ink lines in Fig. 2.

In all the following considerations it will be assumed that the clearance between the male and female dies at the point of maximum penetration (EC in Fig. 11) is equal to the caliper of the board being creased and that the width of the female die channel is at least equal to the width of the creasing rule plus twice the caliper.

In Figure 11 let:
Caliper of the board = c.
Creasing rule thickness = xc.
Depth of female channel = zc.
Half width of female channel = yc.
Half draw = d = arc AC — AB.
Angle of break = angle between tangent at A and top of female = 90° — α.
In triangle AOB

$$r^2 = (yc)^2 + (r - zc)^2 = y^2c^2 + r^2 - 2rzc + z^2c^2$$

$$2rzc = y^2c^2 + z^2c^2$$

$$r = \frac{y^2c^2 + z^2c^2}{2zc} = \frac{c(y^2 + z^2)}{2z}$$

$$\tan \alpha = \frac{r - zc}{yc} = \frac{\frac{c(y^2 + z^2)}{2z} - zc}{yc}$$

$$= \frac{c(y^2 + z^2 - 2z^2)}{2zyc} = \frac{y^2 - z^2}{2yz}$$

$$d = \text{arc } AC - AB \qquad \text{Eqn. 1.}$$

$$= r\left(\frac{\pi}{2} - \alpha\right) - yc$$

$$= \frac{c(y^2 + z^2)}{2z}\left(\frac{\pi}{2} - \tan^{-1}\frac{y^2 - z^2}{2yz}\right) - yc$$

$$= c\left[\frac{y^2 + z^2}{2z}\left(\frac{\pi}{2} - \tan^{-1}\frac{y^2 - z^2}{2yz}\right) - y\right]$$

$$\text{Angle of break} = 90° - \alpha \qquad \text{Eqn. 2.}$$

$$= \frac{\pi}{2} - \tan^{-1}\frac{y^2 - z^2}{2yz}$$

From these equations it is apparent that the following variables operate to affect all cylinder creasing operations:

1. Planning variables
   a. Box size and dimensions.
   b. Board caliper
   c. Board stretch (per cent before rupture)
   d. Grain direction with respect to travel through press.
2. Processing variables
   a. Thickness of creasing rule
   b. Depth of female die channel
   c. Width of female die channel
   d. Draw on press
   e. Angle of break.

It is often found that troubles which occur in the pressroom are not to be remedied by the resources within the control of the pressman; rather they involve the necessity for closer consideration of the planning variables. It should be understood that the processing variables are not entirely independent variables. It often occurs that when the pressman successfully attempts to avoid or remedy one trouble by changes in the depth or width of the female die channels, he automatically encounters the other trouble.

As a practical example of this it was found in one case that a sheet approximately 25x37 inches (grain dimension last) could not be creased without encountering trouble on the press or cracking scores at the glue machine, although every resource of an experienced pressman was applied. Without altering any variables other than the change of grain direction with respect to motion through the press and corresponding change in die orientation, creasing was accomplished without any difficulty at any part of the operation. Due to a peculiar combination of circumstances, it was possible in this particular case to change the direction of sheet travel and die orientation without too much difficulty. This remedy is very seldom possible and had sufficient attention been paid to planning variables, would not have been necessary.

Within commercial limitations, the box size and dimensions, and the caliper of the board used are not within the control of the boxmaker. With these variables fixed, the layout man in the box plant should be in a position to decide the direction of travel of the sheet through the press and to determine the stretch which the board must have to meet the requirements of that particular layout. If the actual board stretch as delivered to the pressman is insufficient to meet the demands of this layout, trouble from torn creases on the press will occur. Then, if the pressman makes changes in the width or depth of the female channels to remedy this trouble, he may or may not encounter cracked creases at the glue machine depending on the inherent ability of the board to bend.

Of the processing variables, the thickness of the creasing rule is not truly an independent variable. The thickness of the rule is determined by the caliper of the board according to the following table:

TABLE I.—THICKNESS OF CREASING RULE

Caliper, inches	Thickness, printers points	Thickness, inches
.016-.023	2	.0278
.024-.035	4	.0556
.036-.050	6	.0833

The depth and width of the female die channels are determined by the experience and ability of the pressman, and fix the draw on the press and the angle of break. However, the draw and the angle of break are the variables to which creasing troubles are directly related. The ratio between the draw for simultaneously rolled creases and the stretch available in this direction in the board will gage the possibility of trouble with torn creases on the press. Insufficient stretch causes the trouble. The greater the angle of break the less inherent bending ability is required of the board to prevent cracked creases at the glue machine. The converse is also true. For a board of given inherent bending ability the less the angle of break, the greater the possibility of trouble due to cracked creases at the glue machine.

Therefore it seems that the fundamental variables of creasing are not the processing variables, but the planning variables. With this in mind the equations have been developed into the form of the charts shown in Figs. 13 and 14. Figure 13 shows the minimum distance between simultaneously rolled creases divided by the caliper plotted against the per cent stretch for different draws. From this the maximum allowable draw for a given layout and a given board caliper and stretch can be determined. Then, from Fig. 14, which plots this allowable draw against the width of female channels for different depths of female channels and for different angles of break, the proper widths and depths of female die channels can be determined to give any desired angle of break. For convenience all of these variables have been combined to form the nomograph shown in Figure 15.

As an example of how these variables interact, take the typical case of a .020 inch board. Assume first that an angle of break of 50 degrees is necessary to prevent cracking creases at the glue machine. Among the possibilities are the following:

Cal., inches	Angle of Break, degrees	Thickness of Creasing Rule, inches	Width of Female, inches	Depth of Female, inches	Draw, inches
.020	50	0.0278	0.068	0.016	0.0094
.020	50	0.0278	0.080	0.019	0.0108
.020	50	0.0278	0.088	0.020	0.0120

It is to be noted that to keep a constant angle of break as the width of the female die channel is increased the depth of the female must be increased and thereby the draw is automatically increased. Now if it is discovered that 50 degrees is an insufficient angle of break and trouble is being experienced on the glue machine, it should be theoretically possible to increase the angle of break while keeping

any one of the other three variables constant as shown in the following:

At constant width of female channel.

Cal., inches	Angle of Break, degrees	Thickness of Creasing Rule, inches	Width of Female, inches	Depth of Female, inches	Draw, inches
.020	50	0.0278	0.068	0.016	0.0094
.020	52½	0.0278	.068	.017	.0104
.020	55	0.0278	.068	.018	.0116

At constant depth of female channel.

Cal., inches	Angle of Break, degrees	Thickness of Creasing Rule, inches	Width of Female, inches	Depth of Female, inches	Draw, inches
.020	50	0.0278	0.068	0.016	0.0094
.020	52½	0.0278	0.064	.016	.0098
.020	55	0.0278	0.060	.016	.0102

At constant draw.

Cal., inches	Angle of Break, degrees	Thickness of Creasing Rule, inches	Width of Female, inches	Depth of Female, inches	Draw, inches
.020	50	0.0278	0.068	0.016	0.0094
.020	52½	.0278	0.060	.015	.0094
.020	55	.0278	.054	.015	.0094

However, the limitation on the minimum width of the female channel (minimum width equals the thickness of the scoring rule plus twice the caliper or 0.0278 + 0.040 = 0.068 inch) eliminates the two last possibilities. Therefore, if the 50 degree angle of break is insufficient the only thing to do is to deepen the female channel keeping the minimum width of female channel, but it is obvious that this increases the draw. If the draw is so great when a sufficient angle of break is obtained that tearing of creases on the press occurs, the pressman is confronted by a dilemma which cannot be solved by the resources at his command. The only solutions are (1) a different layout that allows more stretch for simultaneously rolled creases, (2) board of greater inherent stretch, or (3) board of greater inherent bending ability, that is, board which will perform satisfactorily on the glue machine when creased to a lesser angle or break.

In all the foregoing discussion it has been assumed that all creases have been treated alike. In actual practice however this may not be the case, especially where troubles are occurring. In the typical folding box blank, which is to be glued, there are two creases (known as folding creases) which must be bent 180 degrees by the glue machine. All other creases will

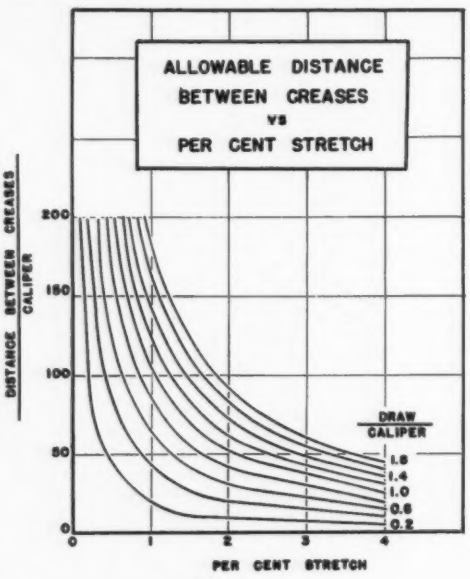


FIG. 13.

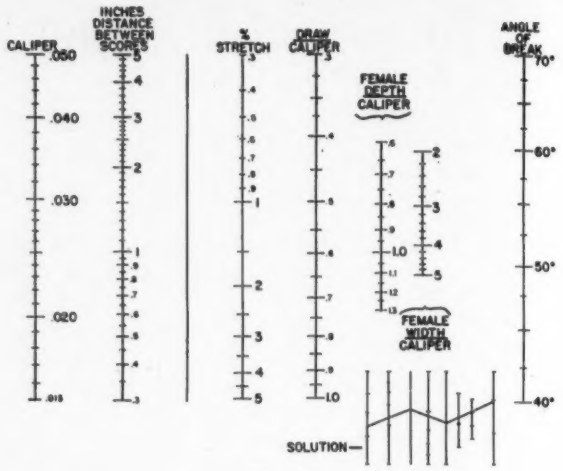


FIG. 15.

be required to bend only 90 degrees. Therefore, to eliminate troubles, it is possible to give the folding creases a greater angle of break with its attendant increased draw, at the expense of decreased angle of break and draw of the other creases. A practical application of the principles exhibited in Figs. 13, 14 and 15 should permit a choice of the most effective approach toward solving any particular cutting press-room difficulty.

Of course, favoring one score over another, as described, is not an economically efficient means of solving the difficulty. Rather, this difficulty could more readily have been eliminated by proper consideration of the layout variables, which should lead to a clear definition of specifications needed for any particular job.

It remains for someone to develop a simple means of measuring numerically, the essential qualities influencing bending.

Acknowledgment

The writers wish to acknowledge the guidance and encouragement of Alec Kienlen, Supt. Folding Carton Plant, Container Corp. of America, 35th Street Division, Chicago.

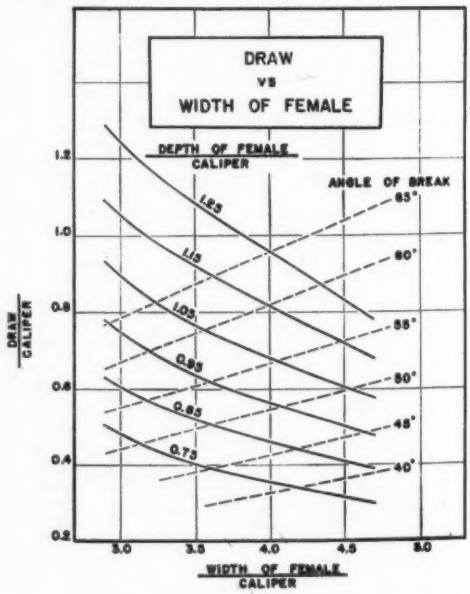


FIG. 14.

Review Of Paper Industry Literature

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Specialties

The Technique of Envelope Manufacture. Heuser. Papier-Ztg. 63, no. 16/17:328, 330, 332 (Feb. 26, 1938).—Reference is made to recent developments of envelope-making machinery.—C.J.W.

Requirements in Paper for Lithographing. T. A. Pascoe. Photo-Lithographer 6, no. 1:23, 45 (January, 1938); National Lithographer 45, no. 4:70 (April, 1938).—"The finish, bulk, sizing, moisture content, and hardness desirable in offset papers, and the avoidance of papers likely to produce excessive fuzz or to corrode the plate, are discussed."—C.J.W.

Punching and Embossing. Papier-Ztg. 63, no. 21:442-4 (March 12, 1938); B. I. P. C. 8:348.—When paper, carton, or board is intended for embossing, the manufacturer should be informed at the time of ordering the material and tests should be made on a few samples to check their suitability for this purpose; this holds especially for coated paper, so that the body stock, as well as the coating, may be chosen accordingly. Otherwise there is the danger of the coated layer breaking off under the stress of the embossing plate. The paper should always be cut with the grain in the machine direction; when it has become too dry during previous manipulations, it should be allowed to acquire a higher moisture content by suitable storing in cellars, etc. Embossing should always be the last operation; all other processes such as printing, punching, scoring, fluting, etc., must be carried out beforehand.—C.J.W.

The Manufacture of Round Boxes. Papier-Ztg. 63, no. 22:462 (March 16, 1938); B. I. P. C. 8:356.—The manufacture of round boxes from a wound or stitched tube is described. Topping and bottoming are either made from tin or board; the latter are glued to the tubular bodies, the protruding end of the tube being bent over the bottom to make a leakproof joint. The containers, depending on their later use, are then impregnated with special lacquers.—C.J.W.

Sorbitol and Glycerin. A. Matagrin. Chem. Ztg. 62, no. 22:196-7 (March 16, 1938); B. I. P. C. 8:351.—Reference is made to the original article published in Industrie Chemique 24:514-8 (1937), in which the author discusses experiments and results of the Atlas Powder Co., Wilmington, Del., for determining the comparative properties of sorbitol and glycerol as plastifiers and softeners. The superiority of sorbitol for plastifying gelatin and for softening and waterproofing special papers is indicated by the results.—C.J.W.

M.G. Finish. Wochbl. Papierfabr. 69, no. 6: 120; no. 8:160; no. 9:183 (Feb. 5, 19, 26, 1938); B. I. P. C. 8:345.—With regard to smoothness and tendency for dusting, which side of a paper or carton web should come into contact with the surface of the Yankee dryer, the wire or the felt side? Most answers agree that neither smoothness nor dusting tendency are affected by direct contact with the Yankee cylinder; the usual practice, however, is to have the wire side touch it. Dusting is favored by high filler contents and M.G. papers are usually made with little filler; the freer the pulp, the less danger exists for dusting. The moisture content of the web before reaching the cylinder also exerts an influence. If the web is too wet, it will stick to the surface and the resulting paper starts to dust. The wire side is originally smoother than the felt side; from this viewpoint it seems more logical to continue the finishing on this side. Since, however, fillers, when present, accumulate on the wire side, some answers favor applying the M.G. finish on the felt side.—C.J.W.

Expedients for Duplicating Purposes. Papier-Ztg. 63, no. 23:486-7 (March 19, 1938); B. I. P. C. 8:345.—A good mimeograph paper should be absorptive, slack sized, and with a moderately rough, noncalendered surface. On pulling a sheet several times between forefinger and thumb, no fibers, sand grains, or sharp wood particles should be given off which would plug up the stencils. Suppliers of mimeograph machinery usually insist that the owner of such a machine purchase stencils, ink, and paper from the same place, because they are then adjusted to each other. Reference is made to stencils for drawing and equipment for preparing them, such as small wheels for drawing lines, special fivefold music line wheels and punches for music printing, etc. The drawing upon stencils requires a certain experience and skill, but does not present unsurmountable difficulties to a draftsman.—C.J.W.

Stencil Sheets. Papier-Ztg. 63, no. 16/17: 360, 362 (Feb. 26, 1938); B. I. P. C. 8:346.—There are two kinds of permanent stencils on the market, cellulose and protein stencils. Cellulose stencils can be used for typing, handwriting, and drawings; protein stencils are not suitable for drawings or a very large number of copies; they are, however, specially adapted for embossing work. Stencils are made by coating Japanese tissue paper with the cellulose or protein mixture. Colored stencils in blue, brown, yellow, green, and red are also manufactured, chiefly for handwriting and drawing. The latest development is photostencils which are chemically treated to make them light-sensitive.—C.J.W.

Asphalt and Bituminous Papers and the Machinery for their Manufacture. Georg Boettinger. Papier-Ztg. 63, no. 13:406, 408 (March 5, 1938); B. I. P. C. 8:346.—Different machinery constructions for making asphalted and bituminous papers for wrapping purposes with plain or creped paper, in web or sheet form, the latter for paper bags, are described.—C.J.W.

Strawboards. Wochbl. Papierfabr. 69, no. 5:101; no. 8:160 (Jan. 29, Feb. 19, 1938); B. I. P. C. 8:323.—The inquirer complains that his straw boards, the thin sheets in particular, become wavy in the direction of the grain, especially in the fall, when straw stored in the open and not from sheds is used. Waviness of thin straw boards can be traced to several reasons, such as the nature of the raw material, or the drying, cutting, and storing of the boards. Old straw stored in the open for over a year is bound to give trouble, especially when mixed with weeds or a large percentage of barley straw. The methods

of cooking and drying play an essential role; overdrying is usually the reason of warping. Other factors worth investigating are whether the boards are cut into sheets upon the paper machine or rolled, how the boards are stored, and where the waviness shows up first, i.e., upon the machine, after cutting or rolling, during storage, or at the converting plant. —C.J.W.

Fire-Resistant Handmade Boards. Wochbl. Papierfabr. 69, no. 4:79; no. 6:120; no. 7:138 (Jan. 22, 29, Feb. 5, 1938); B. I. P. C. 8:322.—The inquirer asks for methods of making handmade board fireproof without resorting to the use of asbestos. It is impossible to make fiberboards from organic substances absolutely fireproof; the only possibility is to reduce their inflammability. This can be done by adding chemicals to the beater or through impregnation by dipping or by coating. The chemicals most generally employed for either treatment are ammonium or oxalic acid salts, zinc chloride, borax and sodium silicate mixtures, titanium dioxide, magnesium chloride, etc. Special reference is made to the suitability of Cellon lacquer, a non-inflammable cellulose acetate. In the case of beater additions, care must be taken that all waste water is re-used; otherwise the loss in chemicals would make the process too expensive. The dipping or coating methods do not involve such losses; however, they require more experienced workers.—C.J.W.

Output of a Board Machine. Wochbl. Papierfabr. 69, no. 5:101; no. 7:138 (Jan. 29, Feb. 12, 1938); B. I. P. C. 8:323.—The inquirer considers the output of his board machine too low. The width is 105 cm., the mold travels 18 m. per minute; the raw material used is ordinary waste paper, and no special demands are placed upon the product. The present daily (24 hour) production is 1800 kg. All answers agree that the output could be higher; increasing the diameter of the cylinder mold (which was not mentioned in the inquiry) will speed up production, provided that the crew is well trained and sufficiently experienced. A coarser mesh and somewhat freer pulp may also help to improve the output.—C.J.W.

Strawboard. Wochbl. Papierfabr. 69, no. 7:138; no. 9:183 (Feb. 12, 26, 1938); B. I. P. C. 8:323.—The inquirer asks whether or not it is possible to obtain a good bending strength in straw board, 2.7 mm. in thickness and pasted with silicate of soda? Silicate of soda definitely makes the boards stiffer and reduces the bending strength. This can be reduced by additions of small quantities of glycerin; if possible, some other adhesive should be employed such as dextrin, latex, or even sulfite waste liquor preparations. When the pasted boards are bent with a large radius it might be possible to manufacture them in the required thickness, thus eliminating the use of the adhesive altogether.—C.J.W.

Wrapper. Harry W. Brown assignor to Edward H. Angier. U. S. pat. 2,103,892 (Dec. 28, 1937).—A wrapping band adapted to be helically wound about a commodity comprises a pair of strips of paper united by means of adhesive. Between the strips, there is one or more reinforcing fibrous strands close to and parallel to each edge; and between these two groups of reinforcing strands is a substantially single, continuous reinforcing strand deposited as a gently sinuous longitudinally extending curve. (Cl. 154-52).—A.P.-C.

Creped Wrapping Paper. Edward H. Engier, assignor to Angier Laboratories. U. S. pat. 2,086,179 (July 6, 1937).—A light coating of elastic rubber is applied to one face only of creped paper in such a manner that it does not conceal the crepings but follows the roughness of the crepings. (Cl. 206-46). —A.P.-C.

Transparent Paper. Thereon G. Finzel and Donald E. Drew, assignors to E. I. du Pont de Nemours & Co. U. S. pats. 2,108,807 to 2,108,810 (Feb. 22, 1938).—*No. 2,108,807*—A highly calendered paper is provided throughout its mass with a wetting agent and is impregnated with a composition free from cellulose derivatives and comprising a resin such as dewaxed shellac in proportion to "transparentize" the paper. *No. 2,108,808*—A transparent waterproof material comprises paper containing a wetting agent and having its voids and spaces substantially completely filled with a water-soluble impregnant such as a starch acetate and thinly coated with a transparent moistureproofing composition such as a lacquer, the impregnant being present to the amount of 10 to 30% the weight of the paper. *No. 2,108,809*—Thin porous paper is treated with a wetting agent and then impregnated with a molten composition comprising a moisture-proofing wax such as carnauba wax, a hard wax such as "Glyco" waxes and a blending agent such as paraffin preventing separation of the waxes and inhibiting the production of haziness in the composition when chilled. The paper is chilled rapidly while the composition is still molten and before crystallization begins. *No. 2,108,810*—A composition for simultaneously "transparentizing" and moistureproofing sheets of paper comprises a lacquer containing a moistureproofing waxy material and di- or tri-ethylene glycol or other suitable glycol or glycol derivatives for softening the cellulosic material. Numerous examples are given. (Cl. 91-68, 91-68, 91-70, 91-68).—A.P.-C.

Waterproofing Felts, Etc. Constantine F. Fabian and Alexander N. Sachanen, assignors to Non-Mercuric Carrot Company. U. S. pats. 2,086,792 and 2,086,793 (July 13, 1937).—The material is treated with a volatile fluid such as gasoline, chloroform or carbon tetrachloride in which is dispersed a small proportion (suitably about 0.25% to 6%) of a stable nonsweating mixture containing a viscous refined petroleum oil and a blend of ceresin wax in sufficient amount to prevent sweating and a relatively much larger amount of paraffin wax or solid fatty acids. (Cl. 91-68, 134-15).—A.P.-C.

Fire-Resisting Electrical Insulation. Fritz Groebe, assignor to General Electric Co. U. S. pat. 2,089,697 (Aug. 10, 1937).—An insulation is prepared by impregnating cellulosic material with a composition which comprises the reaction product of about 2.4 parts of 84% phosphoric acid and 3.7 parts of urea (these reactants being suitably mixed with a resol resin or the like). (Cl. 91-70).—A.P.-C.

Method of Producing Layers of Distended Fibrous Material. George C. Weathered, assignor to Cellufoam Corp. U. S. pat. 2,105,711 (Jan. 18. 1938).—The invention provides various mechanical features of construction of apparatus for forming layers of fibrous material treated with a foaming agent such as saponin. The improvements provide means whereby greater uniformity is secured in the thickness and character of the finished product, and whereby the speed of production can be increased. (Cl. 92-39).—A.P.-C.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING JANUARY 28, 1939

SUMMARY

Cigarette paper.....1,211 cs.
Wall board.....3,510 bdls.
Newsprint.....1,639 rolls
Printing paper.....100 rolls, 41 bls., 6 cs.
Wrapping paper.....920 bls., 3,734 rolls
Tracing Cloth.....21 cs.
Drawing paper.....48 cs.
Filter paper.....7 cs.
Metal covered paper.....37 cs.
Photo paper.....9 cs.
Decalcomania paper.....3 cs.
Tissue paper.....9 cs.
Fancy paper.....2 cs., 1 ble.
Insulating paper.....12 rolls
Letter paper.....1 cs.
Miscellaneous paper.....92 cs., 13 bls.

CIGARETTE PAPER

De Mauduit Paper Corp., *Manhattan,* Havre, 222 cs.
Champagne Paper Corp., *Manhattan,* Havre, 266 cs.
De Mauduit Paper Corp., *Champlain,* Havre, 2 cs.
Champagne Paper Corp., *Champlain,* Havre, 385 cs.
American Tobacco Co., *Champlain,* Havre, 293 cs.
Braunstein Freres, Inc., *Champlain,* Havre, 43 cs.

WALL BOARD

Treetex Corp., *Uddeholm,* Sweden, 3,510 bdls.

NEWSPRINT

Jay Madden Corp., *American Traveler,* Finland, 299 rolls.
National Pulp & Paper Co., Inc., *American Traveler,* Finland, 81 rolls.
Jay Madden Corp., *Caroline Thorden,* Kotka, 377 rolls.
———, *Bergensfjord,* Oslo, 221 rolls.
———, *Bergensfjord,* Skien, 459 rolls.
Jay Madden Corp., *Manhattan,* Finland, 202 rolls.

PRINTING PAPER

Jay Madden Corp., *American Traveler,* Finland, 100 rolls, 41 bls.
S. H. Pomerance & Co., *American Banker,* London, 6 cs.

WRAPPING PAPER

Jay Madden Corp., *American Traveler,* Finland, 920 bls., 2,090 rolls.
L. Glickman & Co., *Manhattan,* Finland, 1,341 rolls, 11 bls.
Jay Madden Corp., *Manhattan,* Finland, 363 rolls.

TRACING CLOTH

Keuffel & Esser Co., *American Shipper,* Manchester, 21 cs.

DRAWING PAPER

Keuffel & Esser Co., *Manhattan,* Hamburg, 38 cs.
Devoe & Raynolds Co., *American Banker,* London, 7 cs.
Keuffel & Esser Co., *American Banker,* London, 1 cs.
H. Reeve Angel & Co., Inc., *American Banker,* London, 2 cs.

FILTER PAPER

Fisher Scientific Co., *Manhattan,* Hamburg, 1 cs.
H. Reeve Angel & Co., Inc., *American Banker,* London, 6 cs.

METAL COVERED PAPER

Winter Wolff & Co., *American Traveler,* Hamburg, 23 cs.
Winter Wolff & Co., *Manhattan,* Havre, 14 cs.

PHOTO PAPER

Medo Photo-Supply Co., *Aquitania,* Southampton, 3 cs.
J. J. Gavin & Co., *Manhattan,* Southampton, 6 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *American Shipper,* Liverpool, 3 cs., (simplex).

TISSUE PAPER

Dingelstedt & Co., *Samaria* Liverpool, 8 cs.
B. F. Drakenfeld & Co., *American Shipper,* Liverpool, 1 cs.

FANCY PAPER

C. A. Haynes & Co., *Aquitania,* Southampton, 2 cs., 1 ble.

INSULATING PAPER

D. C. Andrews & Co., *American Banker,* London, 12 rolls.

LETTER PAPER

Globe Shipping Co., *Champlain,* Havre, 1 cs.

MISCELLANEOUS PAPER

Japan Paper Co., *Yamabiko Maru,* Kobe, 72 cs.
Winsor & Newton, Inc., *American Banker,* London, 2 cs.
Rohner Gehrig & Co., *Champlain,* Havre, 2 cs.
Heemsoth Kerner Corp., *Champlain,* Havre, 2 cs.
———, *Champlain,* Havre, 12 cs.
American Express Co., *Champlain,* Havre, 1 cs., 13 bls.

RAGS, BAGGINGS, ETC.

M. Genti, *Mexico,* Havana, 230 bags cotton rags.
Castle & Overton, Inc., *Wiegand,* Buenos Ayres, 72 bls. bagging.
Manufacturers Trust Co., *Samaria,* Liverpool, 58 bls. rags.
———, *Samaria,* Liverpool, 40 bls. rags.
———, *Yamabiko Maru,* Kobe, 145 bls. rags.
British & Foreign Waste, *American Shipper,* Manchester, 43 bls. cotton waste.
Public National Bank Trust Co., *American Shipper,* Manchester, 2 bls. rags.
———, *American Shipper,* Liverpool, 30 bls. rags.
———, *Ragnhild,* Antwerp, 90 bls. bagging.
Darmstadt Scott & Courtney, *Ragnhild,* Antwerp, 25 bls. bagging.
D. M. Hicks, Inc., *Ragnhild,* London, 14 bls. rags.
Loumar Textile By Products, Inc., *Manhattan,* Hamburg, 116 bls. bagging.
———, *American Banker,* London, 66 bls. rags.
———, *Satartia,* Leith, 60 bls. rags.

HIDE CUTTINGS

———, *American Shipper,* Liverpool, 568 bags.

OLD ROPE

W. Steck & Co., *Veendam,* Rotterdam, 61 coils.

CASEIN

———, *Champlain,* Havre, 5 bags.

WOOD PULP

Castle & Overton, Inc., *Carolina Thorden,* Viipuri, 254 bls. wood pulp, 50 tons.
Pulp Sales Corp., *Carolina Thorden,* Viipuri, 1,270 bls. sulphate, 254 tons.
Pulp Sales Corp., *Carolina Thorden,* Rauma, 3,410 bls. sulphite, 604 tons; 1,930 bls. sulphate, 319 tons.
Chase National Bank, *Bergenstjord,* Oslo, 300 bls. sulphite.
The Borregaard Co., Inc., *Bergensfjord,* Sarpsborg, 1,008 bls. sulphate.
Irving Trust Co., *Bergensfjord,* Oslo, 1,300 bls. chemical pulp.
Bank of N. Y. Trust Co., *Magna,* Hernosand, 300 bls. sulphite, 50 tons.
E. M. Sergeant Pulp & Chemical Co., *Magna,* Hernosand, 900 bls. sulphite, 150 tons.
Irving Trust Co., *Magna,* Hernosand, 600 bls. sulphite, 100 tons.
Central Hanover Bank Trust Co., *Magna,* Hernosand, 600 bls. sulphite, 100 tons.
Goldman Sachs & Co., *Magna,* Hernosand, 3,600 bls. sulphite, 600 tons.

Guaranty Trust Co., *Magna,* Hernosand, 9,600 bls. sulphite, 1,600 tons.
Pagel Horton & Co., Inc., *Uddeholm,* Sweden, 4,792 bls. sulphite.
———, *Uddeholm,* Sweden, 1,750 bls. sulphite—; 2,050 bls. sulphate.
Tradesmans Natl. Bank Trust Co., *Uddeholm,* Sweden, 1,000 bls. sulphate.

WOOD PULP BOARDS

Jay Madden Corp., *Carolina Thorden,* Viipuri, 20 bls., 2 tons.

BOSTON IMPORTS

WEEK ENDING JANUARY 28, 1939

E. Butterworth & Co., Inc., *Satartia,* Leith, 39 bls. old rope.
Price & Pierce, Ltd., *Mormacsea,* ———, 1,200 bls. bleached sulphite.
Tritex Corp., *Uddeholm,* Sweden, 6,021 bdls. wall board.
———, *Uddeholm,* Sweden, 1,057 bdls. wall board; 250 bls. sulphate; 750 bls. sulphite.
Tradesmans Natl. Bank Trust Co., *Uddeholm,* Sweden, 8,725 bls. sulphate.

NEW LONDON IMPORTS

WEEK ENDING JANUARY 28, 1939

Gottesman & Co., Inc., *Boren,* Sweden, 2,400 bls. wood pulp.
Pagel Horton & Co., Inc., *Boren,* Sweden, 5,245 bls. wood pulp.
Price & Pierce, Ltd., *Boren,* ———, 1,350 bls. unbleached sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING JANUARY 28, 1939

———, *Satartia,* Hamburg, 5 rolls newsprint; 357 bls., 503 rolls wrapping paper.
Gottesman & Co., Inc., *Georgia,* Sweden, 3,000 bls. wood pulp.
Philadelphia National Bank, *Satartia,* Hamburg, 12 bls. rags.
J. Wallworth & Son, Inc., *Satartia,* Hamburg, 37 bls. paper stock.
F. Weber & Co., *Belvedere,* Genoa, 5 cs. paper

BALTIMORE IMPORTS

WEEK ENDING JANUARY 28, 1939

Gottesman & Co., Inc., *Topeka,* Sweden, 3,000 bls. wood pulp.
Castle & Overton, Inc., *Carolina Thorden,* Viipuri, 1,553 bls. wood pulp, 313 tons.
Pulp Sales Corp., *Carolina Thorden,* Viipuri, 5,350 bls. sulphite, 1,070 tons.
Pulp Sales Corp., *Carolina Thorden,* Rauma, 3,097 bls. mechanically ground pulp, 619 tons.
Jay Madden Corp., *Carolina Thorden,* Kotka, 1,694 rolls newsprint.
Castle & Overton, Inc., *Black Tern,* Rotterdam, 215 bls. wood pulp, 43 tons.
———, *Black Tern,* Rotterdam, 465 bls. dry pulp, 104 tons.
Congoleum Nairn Co., *Black Tern,* Antwerp, 292 bls. rags.
S. Shapiro & Co., *Satartia,* Hamburg, 4 cs. packing paper.
Castle & Overton, Inc., *Satartia,* Hamburg, 525 bls. wood pulp, 105 tons.
Price & Pierce, Ltd., *Scanyork,* ———, 210 bls. bleached sulphite.

NORFOLK IMPORTS

WEEK ENDING JANUARY 28, 1939

———, *Satartia,* Hamburg, 140 rolls wrapping paper.

Squirrel Cage Motors

Bulletin No. 1195 just issued by the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., describes and gives case studies of Lo-Maintenance Motors that have been operated under adverse conditions. A table of common types of squirrel cage motors and their applications is also included.

Makes High Grade Papers

Another step in the program of equipping the International Falls Plant of the Minnesota & Ontario Paper Company to manufacture high grades of papers was completed late in November with the installation of the new wet end on No. 3 Machine. Considerable preparatory work was done before the old machine was shut down and the change-over to the new equipment was made.

This machine has been completely modernized and is now well suited to the manufacture of paper to rigid specifications on a production basis. The changes just completed included new screens and head box, Fourdrinier section with suction couch, a rubber covered suction press, smoothing press and anti-friction bearings for the drier felt rolls. The Fourdrinier is arranged for a 184 inch wire and is complete with new frames, breast, table and wire rolls all in anti-friction bearings, improved adjustable shake and a number of special features that make it most flexible for the production of a wide variety of papers. The new equipment was supplied by the Pusey & Jones Corporation who built the original machine.

The various improvement projects which preceded the machine changes, included a new groundwood mill, a Chemi-Pulp system, additional pulp screens, the replacement of stock and water lines and the tile lining of chests to assure the delivery of clean quality pulp to the paper mill. With these improvements already made and the modernization of No. 3 Machine just completed, the Minnesota & Ontario Paper Company is following out its rehabilitation policy which contemplates further improvements.

I. P. Co. To Sell Utilities

BOSTON, Mass., February 1, 1939—Directors of the International Paper and Power Company have decided to sell the public utility interests of the company, which are valued at more than $500,000,000.

Details of the plan were announced in Washington through William O. Douglas, chairman of the Securities and Exchange Commission, who said that he had received a telegram from the directors informing him of their decision that the company confine itself to the paper industry and other non-utility activities, the value of which is estimated at $250,000,000.

The plan, it is said, has been under consideration by the directors for six months in cooperation with the commission, and will provide for the immediate separation of the power interests and their eventual sale. It is stated that the utility holdings of the International Paper and Power Company and the International Hydro-Electric System will be transferred immediately to independent trustees, who will administer the properties until their sale within two to four years.

Hollingsworth & Whitney To Build

BOSTON, Mass., February 1, 1939—M. L. Madden, president, told stockholders of the Hollingsworth & Whitney Company, at the annual meeting Tuesday, that studies had progressed sufficiently to assure the building of a pulp and paper mill at Mobile, Ala. It is planned to start construction early this year and complete the plant within twelve months.

LATEST MARKET REVIEW

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, February 1, 1939.

Reports from many manufacturers' representatives, jobbers, and general paper merchants reflect improvement in the sales volume of some grades of paper for the current week. In the opinion of many wholesale distributors a gradual improvement in consumer demand may be expected, with the expansion in sales contingent upon the acceleration of general business activity, which at this date is slowly moving upward.

This is indicated in the index of general business activity for the week ended January 21, which was up to 91.7 per cent, from 90.7 per cent in the preceding week, compared with 82.3 per cent for the corresponding period last year. Production of some 200 paper mills for the week ended January 21 stood at an estimated 80.0 per cent, compared with 66.0 per cent for the corresponding week last year. Production of paper board for a like period was 65.0 per cent, compared with 58.0 per cent for the week ended January 22, 1938.

The newsprint market is relatively quiet, which is more or less normal for this period of the year. No change in production or shipments has been reported for this week. Inventories are lower than last January and while conditions are better than one year ago current consumption is under expectations. Prices are unchanged.

Many grades of white paper are reported as a little improved this week, including some grades of sulphite bonds, a few groundwood papers, and some grades of tissue papers.

Kraft papers continue to reflect improvement and production and orders are higher than for the preceding week, with prices firmer, and unchanged from representative quoted market prices.

The paper board market is reported as stronger. Prices on some grades, such as chip board, which has shown weakness in the past under strongly competitive sales pressure, are now firmer. The outlook in this division of the paper industry is the best in many months. Prices remain unchanged.

Mechanical Pulp

The situation in mechanical pulp continues unchanged for the week. Some improvement is reported in some quarters of the trade but no definite indication of an upward trend, or any important change in prices or demand, is discernable at this date.

Chemical Pulp

No important change in prices or in demand for chemical pulp has been reported this week. Prices on most grades of pulp are conceded to be weak, but prices continue to hold at prevailing levels. No definite trend is apparent at this date and little change is looked for in the trade in the near future.

Old Rope and Bagging

Transactions in old rope are reported as very light, with prices holding steady at prevailing market quotations. Mill buying of old bagging is now light with no change in prices reported this week.

Rags

The demand for rags continues light and the market is quiet. Prices on all grades of domestic rags remain unchanged at prevailing market prices. The foreign rag market is inactive and prices remain nominal.

Old Waste Paper

Mill demand for all grades of waste paper continues below expectations. Prices remain unchanged and relatively steady at prevailing quotations, with no definite improvement in the market situation reflected in reports by the trade for the current week.

Twine

Trading in twine is reported as rather light and the market as quiet. Prices are relatively firm and no changes in quotations on any grade of hard or soft fiber twine are reported this week, except the prices on manila which is now quoted at from .16 to .23 per pound.

Paper Salesmen To Share Cash Awards

A new type of Cover Paper Sales Promotion begins this month with the announcement of a "Better Cover Design and Printing" Contest open to printers, advertising agencies and national advertisers. The contest is sponsored by the Holyoke Card and Paper Company.

Already over 130 paper merchants and more than 2,000 paper salesmen have signified their intention of participating in the campaign to capture their share of the $885.00 in cash prizes which will be awarded salesmen countersigning the winning entries.

The contest begins in February 1939 and closes December 15, 1939. Trade paper advertising, direct mail and publicity will back up salesmen's efforts to acquaint their customers and prospects with news of the awards which are suitably inscribed gold and silver trophies.

While the contest is primarily conducted to promote and encourage a better appreciation of the value of good design and printing on cover papers, it is obvious that in addition to sharing in cash awards, paper salesmen will also have an opportunity to obtain closer contacts with customers and prospects because of the campaign.

Complete information about the contest can be obtained from the Holyoke Card and Paper Company, Springfield, Mass.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, February 1, 1939.

BLANC FIXE—Quotations on blanc fixe are unchanged at prevailing market prices. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Prices on bleaching powder continue firm and unchanged. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues fair for the current week. Standard domestic casein, 20-30 mesh, is quoted at 8½ cents per pound; 80-100 mesh at 9 cents per pound. All prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda remain unchanged at prevailing market levels. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay continue firm and unchanged at prevailing market quotations. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine are unchanged and conform to prevailing market levels. Chlorine is quoted at $2 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as fair for the week. "G" gum rosin is quoted at $5; "F" wood rosin at $4.25, per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.75 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake continue firm and unchanged. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Prices on soda ash are unchanged and conform to prevailing market quotations. Prices on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch continue unchanged for the week. Globe pearl is quoted at $2.60 per 100 pounds; special paper starch is offered at $2.70 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are unchanged at prevailing market quotations. The commercial grades are quoted at $1.15; iron free at $1.30, per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Prices on sulphur continue firm and conform to prevailing market quotations. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Quotations on talc are firm and unchanged for the week. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Schroon River Reelects Directors

At the annual meeting of stockholders of the Schroon River Pulp and Paper Company at Warrensburg, N. Y., directors were reelected as follows: Albert L. Emerson, Philip E. Rice, Franklin E. Pasco, Warrensburg; Joseph Giannini, Schroon Lake; Walter S. Mack, Jr., Wallace Groves, New York City.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.12½	@	4.62½
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.50	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	9.75
No. 2 Jute	7.50	@	9.00
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	27.50	@	30.00
Chip	27.50	@	30.00
Sgl. Mla. Ll. Chip.	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated.	55.00	@	57.50
Kraft Liners	42.50	@	45.00
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1.	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	@ 36.50	32.20	@ 37.75
85% Rag	.....		29.90	@ 35.00
75% Rag	23.60	@ 27.75	24.75	@ 29.00
65% Rag	.....		21.65	@ 26.25
50% Rag	17.55	@ 21.50	18.70	@ 22.75
25% Rag	14.65	@ 17.75	15.80	@ 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.60	@ $10.50	$9.75	@ $12.00
No. 2	7.70	@ 9.50	8.90	@ 10.75
No. 3	6.85	@ 8.25	8.00	@ 9.75
No. 4	6.45	@ 7.75	7.60	@ 9.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$10.80	@	$12.50
No. 2 Glossy Coated	9.25	@	10.75
No. 3 Glossy Coated	8.15	@	9.50
No. 4 Glossy Coated	7.65	@	9.00
No. 1 Antique (watermarked)	7.65	@	9.00
No. 2 Offset	7.00	@	8.25
A Grade E. F.	6.80	@	8.00
A Grade S. & S. C.	7.05	@	8.25
B Grade E. F.	6.25	@	7.50
B Grade S. & S. C.	6.50	@	7.75
C Grade E. F.	6.00	@	7.00
C Grade S. & S. C.	6.25	@	7.25
D Grade E. F.	5.70	@	6.75
D Grade S. & S. C.	5.95	@	7.00

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	25.00	@	28.00
Dry	25.00	@	28.00
(Delivered)			
No. 1 Domestic and Canadian	29.00	@	33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.25	@	2.75
Prime Qualities—			
Easy-Bleaching Sulphite	1.90	@	2.10
Strong Unbleached Sulphite	1.80	@	2.00
(On Dock, Atlantic Ports)			
Kraft Bleached	2.50	@	2.75
Kraft Light & Strong	1.60	@	1.75
Kraft No. 1	1.45	@	1.65
Kraft No. 2	1.40	@	1.45
(F. o. b. Pulp Mill)			
Kraft Domestic	1.25	@	1.75
(Delivered)			
Soda Bleached	2.55	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.75	@	7.00
Silesias No. 1	4.00	@	4.25
New Unbleached	6.50	@	6.75
Blue Overall	4.75	@	5.00
Fancy	2.00	@	2.15
Washables	1.50	@	1.60
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	4.00		4.25

Old Rags

White, No. 1—			
Repacked	2.90	@	3.15
Miscellaneous	2.10	@	2.25
White, No. 2—			
Repacked	1.50	@	1.60
Miscellaneous	1.25	@	1.40
Thirds and Blues—			
Repacked	1.30	@	1.40
Miscellaneous	1.25	@	1.30
Roofing Rags—			
No. 1	1.10	@	1.20
No. 2	.90	@	1.00
No. 3 (bagging)	.60	@	.70
No. 4	.65	@	.70
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.10	@	2.20
Domestic	1.90	@	2.00
Wool Tares, light....	1.70	@	1.80
Wool Tares, heavy...	1.80	@	1.90
Bright Bagging.....	1.70	@	1.80
Manila Rope—			
Foreign	2.60	@	2.75
Domestic	2.00	@	3.00
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.50	@	1.60
Mixed Strings.....	.55	@	.60

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.40	@	2.50
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.60	@	1.75
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag.....	.70	@	.75
Solid Flat Book...	.60	@	.65
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.10	@	1.20
Ledger Stock Colored	.60	@	.70
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut.....	1.40	@	1.50
New Cuttings.....	1.00	@	1.20
Old Kraft Machine—			
Compressed bales..	.50	@	.60
News—			
No. 1 White News	1.25	@	1.30
Strictly Overissue..	.40	@	.45
Strictly Folded....	.30	@	.35
No. 1 Mixed Paper..	.15	@	.20

Twines

(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.12¼	@	.14¼
White Hemp.....	.13¾	@	.15¾
Fine Polished—			
Fine India.....	.16	@	.18
Unpolished—			
Box	.09½	@	—
Paper Makers.....	.09½	@	.10½
Tube Rope.....	.10¼	@	.12½
Wall Paper.....	.10¾	@	.12½
Wrapping	—	@	—
Soft Fiber Rope...	.12	@	.14
Cotton	.17	@	.20
(Hard Fiber)			
Medium Java.....	.11	@	.17
Mex. Sisal.....	.10	@	.16
Manila	.16	@	.23
Domestic	2.65	@	2.75
Sisal Rope.....	1.60	@	1.65
Mixed Rope.....	.40	@	.50
Transmission Rope...	1.90	@	2.00
Soft Jute Rope.....	1.80	@	2.00
Jute Carpet Threads.	.75	@	.90
Gunny Bagging—			
Foreign	1.75	@	2.00
Domestic	1.60	@	1.70
Bleachery Burlap....	2.75	@	3.00
Scrap Burlap—			
Foreign	1.50	@	1.60
Domestic	1.40	@	1.55
Scrap Sisal.....	1.25	@	1.50
Scrap Sisal for Shredding	1.50	@	1.60
Wool Tares, Heavy..	1.60	@	1.65
New Burlap Cuttings	2.00	@	2.25
Aust. Wool Pouches.	2.75	@	3.00
Heavy baling bagging	1.75	@	1.85
Paper Mill Bagging..	1.00	@	1.15
No. 2 Bagging.....	.50	@	.70

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1...	.06¾	@	.07
New Light Flannelettes	.04¾	@	—
Silesias No. 1.....	.04¾	@	—
New Black Silesias..	.03¾	@	.04
Soft Unbleached.....	6.50	@	7.00
Blue Cheviots.....	.05	@	.05¼
Fancy	.03	@	.03¾
Washable	.02¾	@	.03
Cottons—According to grades—			
Blue Overalls.....	.04¾	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.03	@	.03½
O. D. Khaki.....	.04	@	—
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B. V. D. Cuttings...	.06¾	@	—

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Old Blue Overalls...	1.50	@	—
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.10	@	—
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias.....	4.75	@	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06¼
New White, No. 2.	.03½	@	.04
Light Silesias.....	.03½	@	.04
Silesias, No. 1....	—	@	.04½
Black Silesias, soft	—	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01½	@	.01¾
Blue Overall.....	.04	@	.04½
Cottons—Acording to grades—			
Washable No. 2...	.01	@	.01¼
New Blue.....	.01	@	.01½
Fancy Percales....	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	1.20
Domestic No. 1...	—	@	1.10
Domestic No. 2...	—	@	.90
Roofing Bagging..	—	@	.80

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	2.00
Domestic	1.50	@	1.75
Manila Rope.....	—	@	3.50
Sisal Rope.....	1.50	@	1.75
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.75
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	.75	@	1.00
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.25	@	2.30
No. 2 Hard White.	1.90	@	2.00
No. 1 Soft White..	1.75	@	1.80
No. 2 Soft White..	1.30	@	1.40
No. 1 Mixed.....	.65	@	.75
Solid Ledger Stock..	1.45	@	1.50
Ledger Stock, white.	1.15	@	1.20
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.60	@	.75
Manila Cuttings.....	1.45	@	1.50
Print Manila.....	.40	@	.45
Container Manila....	.35	@	.40
Kraft Paper.....	.75	@	.80
No. 1 Mixed Paper..	.20	@	.25
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.40	@	.45
Old Newspapers.....	.35	@	.40

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.70	@	1.85
Manila Envelope Cuttings, extra quality.	2.00	@	2.10
No. 1 Old Manila...	.75	@	.85
No. 1 Old Manila...	.80	@	.90
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.80	@	.85
Mixed Papers.....	.15	@	—
Print Manila.....	.45	@	.55
Container Manilas...	.27½	@	—
Old Newspapers.....	.25	@	.32½
Paper Wool Strings..	.50	@	.65
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.25	@	.30
Kraft corrugated boxes	.60	@	.65
Screening Wrappers..	.40	@	.45

Bagging

(F o. b. Boston)

Manila Rope—			
Foreign	2.65	@	2.75

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila.....	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.20
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White $35.50		@	—
No. 1 Tints 36.50		@	—
No. 2 White 25.50		@	—
No. 2 Tints 26.50		@	—
No. 2 Golden Rod.. 27.50		@	—
No. 3 White 21.00		@	—
No. 4 White 15.00		@	—
No. 4 Tints 16.00		@	—
No. 4 Golden Rod.. 17.00		@	—
Direct mill shipment in three-ton lots			
No. 5 White $10.50		@	—
No. 5 Tints 11.50		@	—
No. 5 Golden Rod.. 12.00		@	—
No. 6 White 9.00		@	—
No. 6 Tints 9.50		@	—
No. 6 Golden Rod.. 11.00		@	—
No. 7 White 8.00		@	—
No. 7 Tints 8.50		@	—
No. 7 Golden Rod.. 10.00		@	—
Book—			
No. 1 M. F. $7.00		@	—
No. 2 M. F. 6.50		@	—
No. 3 M. F. 5.25		@	—
No. 1 S. C. 7.25		@	—
No. 2 S. C. 6.75		@	—
No. 3 S. C. 5.75		@	—

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$12.00		@	—
No. 2 ..... 10.25		@	—
No. 3 ..... 8.90		@	—
Coated tinted 13.00		@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.25
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.15
No. 1 Manila.....	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2.....	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)...46.00		@	—
Sheets 54.00		@	—

Pulp

Ground wood.....29.50		@	—
Bleached sulphite....54.00		@	—
Unbleached sulphite..44.00		@	—
Kraft 50.00		@	—
Soda 51.00		@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

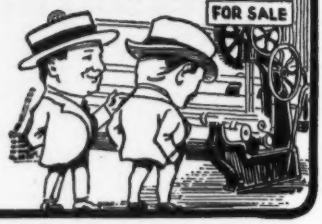
Shavings—			
White Env. Cut...	2.25	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.70	@	—
Light and Crumpled Book Stock.	.60	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut..	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.02½

The CLEARING HOUSE



SITUATIONS WANTED ADVERTISEMENTS—4c a word, double rates for heavy face type. Minimum charge $1.00. If repeated ½ rate will be charged for each consecutive repetition.

HELP WANTED ADVERTISEMENTS—4c a word. Double rate for heavy face type. Minimum charge $1.00.

CLASSIFIED ADVERTISEMENTS—4c a word. Double rate for heavy face type. Minimum charge $1.00.

All classified advertisements are payable in advance.

HELP WANTED

SALARIED POSITIONS—$2,500 to $25,000. This thoroughly organized advertising service of 29 years' recognized standing and reputation, carries on preliminary negotations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been $2,500 or more, send only name and address for details. R. W. Bixby, Inc., 117 Delward Bldg., Buffalo, N. Y. tf

EXPERIENCED SUPERCALENDER OPERATOR for new high speed stack located in New England. State age and experience including previous positions. Address Box 39-42, care Paper Trade Journal. F-9

WANTED — Salesman handling paper mill specialty equipment to sell The FAW Revolving Wire Guide Pan in territory west of the Rocky Mountains. Address Box 39-49, care Paper Trade Journal. F-16

NIGHT SUPERINTENDENT for one machine, fourdrinier, .009 straw mill. Give qualifications and references. Address to Muskingum Fiber Products Corporation, Box 419, Coshocton, Ohio. F-2

NEWSPRINT PAPER SALESMAN—Must be young man of experience and wide acquaintance with publishers. Preferably a person with good background in paper and pulp business. Attractive position awaits the right individual. Write fully. Address Box 39-54, care Paper Trade Journal. F-9

SITUATIONS WANTED

STYMIED—I started seven years ago in paper mill and worked from swipe to foreman for four years. This was followed by three years in paper sales. Under present conditions impossible to expand experience or increase income of fifty dollars a week. Am I worth this to you with opportunity to advance? Christian, college graduate. Age 29. Address Box 39-30, care Paper Trade Journal. F-2

GRADUATE MECHANICAL ENGINEER—20 years' experience with leading paper mills and prominent consultant, desires temporary or permanent connections, introducing latest methods in paper making, stock preparation, power plants, leading to reduced manufacturing costs, or designing new mills and power plants. Also will act as investigator and prepare reports for appraisal, refinancing or reorganization. Address Box 39-20, care Paper Trade Journal. F-2

CARDBOARD-CONVERTING EXECUTIVE—Employed, wants new connection. Broad experience in manufacturing wide variety of boards. Knowledge of allied lines. Opportunity essential, location secondary. Address Box 39-7, care Paper Trade Journal. F-23

POSITION WANTED AS MILL SUPERINTENDENT—At present employed but desires change for better opportunities. On light weight specialties and fine tissues. Also wadding and facial tissues on Fourdrinier and Cylinder Machines. Can furnish best of references. Willing to go anywhere. Can assure results. Address Box 39-40, care Paper Trade Journal. F-2

SITUATIONS WANTED

SALES EXECUTIVE—Young, good education and background, wants selling connection in Eastern Territory. Ten years' experience on practically all grades of Sulphite, Groundwood and Kraft Papers. Widely acquainted with Converting and Merchant trade. Now employed by prominent mill. Confidential interview requested. New York or Chicago. Address Box 39-56, care Paper Trade Journal. F-23

MILL MANAGER or SUPERINTENDENT—Broad experience on Krafts, Tissues, Lightweight Chip and Specialties. Experience covers Yankee, Fourdrinier and Cylinder Machines. Can increase your quality and production. Initial salary secondary. Will go anywhere. Address Box 39-33, care Paper Trade Journal. F-9

COATER and MULTI-TONE PRINTER desires position. Years' of experience on Tag, Book Papers, Cover Stock, Box Papers, Kraft Board for Photo Mounts. Have best of references. Address Box 39-24, care Paper Trade Journal. F-2

YOUNG MAN with thorough knowledge of the manufacture of folding paper boxes, desires position as superintendent or assistant. Address Box 39-41, care Paper Trade Journal. F-2

EXPERT COATING and COLORMAN desires position with progressive paper specialty mill. Practical paper chemist, Mechanical training. Knows costs and production. 12 years' experience. Available immediately. Address Box 39-47, care Paper Trade Journal. F-2

CHEMIST—University technical graduate; high grade training and ten years' plant and laboratory experience—pulp, paper, board and specialty mills. Unemployed. Address Box 39-50, care Paper Trade Journal. F-9

FOR SALE

FOR SALE OR LEASE—Wet Machine Mill—Can be made suitable for Binders Board, Fibre Board or Press Board—Boston vicinity. Address Box 38-381, care Paper Trade Journal. tf

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FOR SALE—64" Twentieth Century Cutter, rebuilt and fully guaranteed. Address Box 39-52, care Paper Trade Journal. F-2

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FOR SALE

Harper Fourdrinier Machine, trims 72". Two presses. 19 dryers 36 x 76". Two calenders. Reel. Winder. Drive.
Experimental Fourdrinier Machine 48" wire.
Moore & White Fourdrinier part, suspension type takes a wire 80" x 50', with suction couch roll.
Dryers: 40—36" x 84".
Ream Cutters: 3 Seybolds 50" to 54".
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Approximately 1,000 calender and press rolls.

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FOR SALE

5—62" Butterworth Embossing Machines.
1—72" Embossing Machine, all complete with direct connected motors.
2—60" 3 roll Smoothing Calenders, motor driven.
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We accept scrap metal in payment.
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BUSINESS OPPORTUNITY

WANTED—Exclusive Sales Agencies for New England on commission basis for paper and paper specialties. Address Box 39-46 care Paper Trade Journal. F-2